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ABSTRACT

A project examined the nonecomomic effects of secondary vocational education on six types of outcomes measured while respondents were in high school (basic skills, career expectations, significant others' career expectations for the student, attitudes such as self-esteem and locus of control, grades, and homework), and five types of post-high school outcomes (postsecondary education, marriage and family, voting behavior, criminal behavior, and substance use). Two major national data sets were used to study these outcomes: the High School and Beyond (HSB) survey and the National Longitudinal Survey New Youth Cohort (NLS). Three measures of curriculum were used: vocational profiles based on student transcripts; self-reporting of academic, vocational, and general curriculum; and a curriculum index of coursework, self-report track, remedial courses taken, and honors courses taken. A large number of control variables were included in the analyses. Results of the study indicate small negative effects of vocational curriculum on basic skills, educational expectation, occupational expectation, perceived ability to complete college, grades, and hours per week spent on homework. Findings regarding postsecondary schooling are mixed. Vocational curriculum in high school does not appear to have strong effects on the other outcomes studied. Limited evidence showed that vocational education is associated with reduced use of marijuana and other drugs, as is academic curriculum. (KC)

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NONECONOMIC EFFECTS
OF VOCATIONAL EDUCATION

Lawrence Hotchkiss

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FOREWORD

Legislation concerning vocational education has placed primary emphasis on the economic consequences of vocational education. Consequently, a large research literature has developed designed to assess wage and earnings advantages that might accrue to individuals with secondary vocational education. In contrast, very little research has investigated potential noneconomic outcomes of secondary vocational education. Yet there are reasons to believe that vocational education has important consequences on factors such as basic skills development, educational expectation, occupational expectation, postsecondary schooling, and self esteem. This study is designed to help close the gap between knowledge of economic consequences of vocational education and knowledge of noneconomic consequences. It must be acknowledged that much remains to be learned, but the present study launches important first steps. The National Center for Research in Vocational Education is pleased to offer this report to the research community. It is hoped that the research reported here both informs research scholars and helps to stimulate more research on the topic.

Several individuals have contributed to this report. In particular, the National Center extends appreciation to N. L. McCaslin, Associate Director, Evaluation and Policy Division and to Lawrence Hotchkiss, project director and author of the report.

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EXECUTIVE SUMMARY

Substantial literature on the economic outcomes of secondary vocational education now is available, and the findings are important and encouraging. In contrast, very little is known about the noneconomic consequences of secondary vocational education. Yet, potential noneconomic outcomes of vocational education in high school are important. First, it is unclear, based on economic theory, how to interpret economic advantages that may accrue to individuals with vocational education. Second, noneconomic outcomes such as basic skills, postsecondary education, family formation, drug use, and criminal activity have important impacts on the economy. Basic skills and postsecondary schooling shape the pool of human capital available for market production. Family formation and fertility influence expenditures on education, the size of the labor pool, and aggregate demand for goods and services. Criminal activities and drug use affect the amount of human talent focused on productive activities and the amount of national resources devoted to law enforcement, rehabilitation programs, and the sense of personal well being of those who may be victims of crimes.

This project examined the effects of secondary vocational education on six types of outcomes measured while respondents remained in high school and five types of post-high school outcomes. The six types of in-school outcomes are--

- Basic skills (4 test scores)
- Career expectations (educational & occupational expectations)
- Significant others' career expectations of the respondent (e.g., number of years of schooling one's mother expects one to complete)
- Attitudes (e.g., self-esteem, perceived ability to complete college, locus of control, work values, community values, altruism)
- Grades in high school
- Homework

The five categories of post-high school outcomes are--

- Postsecondary education and training (e.g. college attendance, junior college attendance, technical school attendance)

- Marriage and family (e.g., marriage, separation, fertility)

- Voting behavior (registered, voted)

- Criminal behavior (e.g., percentage of income from illegal activities)

- Substance use (tobacco, alcohol, marijuana, other)

Two major national data sets were used to study these outcomes, the High School and Beyond (HSB) survey and the National Longitudinal Survey New Youth Cohort (NLS). Three measures of curriculum were used. The primary measure consists of the vocational profiles created by Paul Campbell. This typology is based on student transcript data. The second measure is the traditional self-report track consisting of 3 categories--academic, vocational and general. The final measure is a curriculum index consisting of coursework, self-report track, taken remedial courses, and taken honors courses.

Because selection of vocational curriculum in high school is influenced by many of the same variables that influence the outcomes studied here, it is important to include a large array of control variables in the analyses. It is especially important to control for lagged values of senior year outcomes like test scores and educational expectation, as these variables are stable over time and have a strong influence on curriculum choice. The statistical analyses conducted during this project therefore did incorporate many control variables. The usual controls for socioeconomic background, race, gender, ethnicity, and region were included. Additionally, where possible, lagged values of the in-school outcomes were included as controls. For example, in the HSB analyses, sophomore year measures of test scores, career expectations, attitudes, grades, and homework were controlled when examining senior-year measures of the same variables as outcomes and when post-high school outcomes were studied. Available controls in the NLS are somewhat more limited than in the HSB, but a large member of pertinent controls nevertheless were included. The sample sizes of the HSB and NLS are large enough to support statistical analyses with many variables. Although causal inference is always risky, especially in the absence of experiments and presence of measurement error, the results reported here probably are more secure than in most statistical analyses with survey data.

Results of the study indicate small negative effects of vocational curriculum on basic skills, educational expectation, occupational expectation, perceived ability to complete college, grades, and hours per week spent on homework. The curriculum index has a much stronger positive effect on these outcomes. Findings regarding postsecondary schooling are mixed. In the HSB sample, vocational curriculum in high school reduces attendance at a 4-year college after high school, but it does not preclude college education. This result is confirmed with the total NLS sample, but it is not confirmed with a subsample of the NLS in which it was possible to properly implement controls for educational and occupational expectations measured in early high school. Vocational curriculum in high school does not appear to have strong effects on the other outcomes studied during this project. It is nevertheless encouraging to find limited evidence that vocational education is associated with reduced propensity to use marijuana and other drugs, as is academic curriculum.

CHAPTER 1

INTRODUCTION

Although a broad range of goals for vocational education has been espoused, a primary goal is to prepare youth for entry into paid employment. The emphasis on narrow job-specific training was particularly strong in the early years of vocational education, as explicated in the Smith-Hughes Act of 1917. More recent legislation broadened the goals of vocational education, placing increasingly strong importance on equity for minorities, females, disadvantaged, and handicapped. The Education Amendments of 1976 and the Carl D. Perkins Vocational Education Act of 1984, however, still require that vocational education be evaluated against the economic benefits that accrue to individuals who receive vocational education.

Because the prime goals and evaluation criteria of vocational education have been economic, a growing empirical literature has developed that is designed to assess wage and hours benefits of participation in vocational education. In contrast, relatively little is known about noneconomic consequences of vocational education. Yet, there are at least three reasons why it is a mistake to confine attention in the evaluation of vocational education to economic benefits that may accrue to individuals who have taken vocational education. First, it is unclear whether aggregate social and economic benefits of vocational education bear any relationship to individual wage and hours differentials between those with and without vocational education. Economic theory of competitive markets suggests that wage and hours differentials between those with and without vocational training are not indicative of the aggregate social benefits of vocational education. Second, the educational philosophy of vocational education indicates that there may be important noneconomic consequences of vocational education, primary among these being dropout prevention. Third, noneconomic and economic variables operate in a complex world of mutual interdependencies. For example, productive capacity is influenced by dropping out of school and, more generally, by the level of education one attains. Conversely, education is costly. Similarly, marital status and parenthood affect economic variables (e.g., labor force status) and are, in turn, affected by economic variables (e.g., income).

One of the focal elements in the rationale for vocational education is that it provides additional options for youth who, for reasons of temperment, career goals, interests, or aptitudes may not be well suited for a traditional abstract curriculum. It would be easy to overlook the potential importance of this aspect of vocational education in a world dominated by a competitive model. A competitive world, however, implies--produces--some "winners" and some "losers." From the standpoint of public policy, it is important to worry about what happens to those who are not successful by prevailing standards. This is a classic theme in the literature on deviance. In a much cited essay, Merton (1957) proposes a paradigm defined by cross-classifying acceptance of social standards of success ("cultural goals") by acceptance of social norms defining permissible means for achieving success ("institutionalized means") Merton's scheme is reproduced in exhibit 1:

EXHIBIT 1
MERTON'S TYPES OF ADAPTATION

Modes of Adaptation	Cultural Goals	Institutionalized Means
Conformity	+	+
Innovation	+	-
Ritualism	-	+
Retreatism	-	-
Rebellion	±	±

Source: Merton (1957, p.140).
The ± symbol means rejection of old values accompanied by attempts to institute new ones, e.g., change the rules.

The types labeled "innovation" and "retreatism" are of most interest in the present context. If youth are unable to achieve success by current standards--for example, to do well in school--they are more likely to engage in deviant acts ranging from minor deviance such as refusal to complete homework, truancy, misbehavior in class, "featherbedding" on the job, and occasional marijuana use to major criminal behaviors. This collection of hypothesis is often called "strain" theory (Elliot, Huizinga, and Ageton 1985).

This discussion certainly is not meant to imply that vocational education should be viewed in narrow terms of preventing deviance and delinquency. The main point is this: By providing viable alternatives to a strict academic curriculum and by complementing the academic curriculum, vocational education may help to avert the sense of frustration that accompanies failure to achieve a tightly prescribed course of learning. In doing so, vocational education may contribute to integration of individuals into social life. If this broad hypothesis is true, then it should be manifest in small effects of vocational education on a wide variety of noneconomic outcomes indicative of social integration. These outcomes include divorce, substance use/abuse, effort in school, voting behavior, family stability, self-esteem, locus of control, and child care.

The argument linking vocational education to diverse outcomes such as substance use and voting behavior via strain theory entails a number of untested links in a long chain, however.

There are more direct reasons to presume that vocational curriculum may influence outcomes such as basic skills, academic knowledge, career plans, and postsecondary schooling. Secondary vocational education is primarily designed to prepare youth for immediate entry into the labor market. Hence, one might expect to find less acquisitions of academic knowledge and lower incidence of attendance at a four-year college or university among youth with vocational education in high school than among other youth. On the other hand, vocational education combined with strong academic education might contribute positively to these outcomes due to a complementarity factor. The issues just raised are important, but many of them have not been addressed seriously in prior research.

The present study takes initial steps toward resolving these issues; it builds on past research by exploring the relatively uncharted domain of noneconomic outcomes of vocational education in high school and compares those effects to the effects of other curricula. With the exception of the studies of the impact of vocational education on dropping out, little empirical work on this topic has been reported to date. Hence, the results reported here will be exploratory. A broad array of outcomes will be examined. These include attitudes such as self-esteem, locus of control, and work values; academic achievement as measured by test scores and grades; attendance at postsecondary institutions (including 4-year colleges and universities), substance abuse, deviant behavior, and family variables.

The approach is to conduct statistical analyses of existing survey data. Information from both the High School and Beyond (HSB) and the National Longitudinal Survey Youth sample (NLS) will be utilized. Preliminary empirical tests of a large number of speculative hypotheses that have been stated will be conducted.

The accompanying table (table 1) presents the major variables and their status as independent or dependent. Subsequent chapters will specify the nature of the expected relationships between and among them. The variables are based upon questions included in the national longitudinal surveys.

TABLE 1

VARIABLES AVAILABLE IN THE DATABASES

Dependent Variables	Vocational Concentration	Other Curriculum	Gender	Race/ Ethnicity	Limited English Speaking	Socio-economic Status	Rural, Urban, Suburban	Academic Ability
	Independent Variables							
Family Stability (# of marriages, separations)	NLS HS&B	NLS HS&B	NLS HS&B	NLS HS&B	NLS HS&B	NLS HS&B	NLS HS&B	NLS HS&B
Child Medical Care	NLS	NLS	NLS	NLS	NLS	NLS	NLS	NLS HS&B
Voting Behavior	HS&B	HS&B	HS&B	HS&B	HS&B	HS&B	HS&B	NLS HS&B
Substance Abuse (# and frequency)	NLS	NLS	NLS	NLS	NLS	NLS	NLS	NLS HS&B
Criminal Behavior (Frequency and seriousness)	NLS HS&B	NLS HS&B	NLS HS&B	NLS HS&B	NLS HS&B	NLS HS&B	NLS HS&B	NLS HS&B
Secondary Basic Education	HS&B	HS&B	HS&B	HS&B	HS&B	HS&B	HS&B	HS&B
Postsecondary Education (Type and completion)	NLS HS&B	NLS HS&B	NLS HS&B	NLS HS&B	NLS HS&B	NLS HS&B	NLS HS&B	NLS HS&B
Self-Esteem	HS&B	HS&B	HS&B	HS&B	HS&B	HS&B	HS&B	HS&B
Locus of Control	HS&B	HS&B	HS&B	HS&B	HS&B	HS&B	HS&B	HS&B
Career Expectations	HS&B	HS&B	HS&B	HS&B	HS&B	HS&B	HS&B	HS&B
"Altruism"	HS&B	HS&B	HS&B	HS&B	HS&B	HS&B	HS&B	HS&B

NOTE: Independent variables cross columns; dependent variables cross rows.

CHAPTER 2

CONTEXT OF THE STUDY

This chapter is organized into three sections. The first reviews research on economic outcomes of secondary vocational education. The second summarizes literature on noneconomic outcomes. The third takes up conceptual and measurement issues related to operational procedures for defining degree and type of participation in vocational education.

Economic Effects

Early studies of economic benefits of secondary vocational education mainly conclude that the economic payoffs are small or nonexistent (e.g., Grasso and Shea 1979; Gustman and Steinmeier 1981; Meyer and Wise 1982). However, small benefits have been more consistently observed for women than for men (e.g., Grasso and Shea 1979; Mertens and Gardner 1981).

Two developments have operated to alter these early pessimistic results. First, recent studies have relied on transcript records of high school courses completed rather than student reports of membership in academic, general, or vocational curricula. Second, recent studies have examined effects for youth who are working in jobs related to their vocational education. Positive economic payoffs of vocational education have been reported when these procedures are used (e.g., Campbell et al. 1986; Campbell and Basinger 1985; Gardner 1984; Daymont and Rumberger 1982).

Despite substantial progress toward evaluating secondary vocational education represented in recent research, much remains to be learned. Even within the human capital framework that undergirds most of the research on economic benefits of secondary vocational education, many difficulties are evident. First, none of the studies assess economic benefits for more than a few years following high school. Yet, human capital theory is framed within the context of lifetime discounted earnings. It is well known that age earnings curves vary dramatically by years of schooling and occupation and that earnings differentials are highly compressed at young ages.

Second, it is not clear that effective vocational education should be measured by economic benefits to individuals. Theory of markets indicates that wage differentials between vocational and nonvocational students will reduce to zero in the long run (Gustman and Steinmeier 1979; Meyer 1981). Alternatively, in imperfect markets, wage differentials might persist due to queuing effects (Thurow 1975), leaving little or no net economic benefits in the aggregate. According to this argument, credential effects simply serve to change the distribution of goods and services and have little or no impact on productivity or total production.

Third, one of the fundamental aspects of the philosophy/rationale for secondary vocational education is that it provides options for youth whose temperament, learning style, attitudes, interests, and abilities are incongruent with academic course work. This rationale implies that the benefits of vocational education should depend on factors such as learning style, interest, and ability. Yet no study has tested the interaction specifications implied by this type of hypothesis. To do so adequately probably requires large samples and precise measurements that are not available even in national surveys such as the High School and Beyond (HSB) and the class of 1972. The study by Campbell and coauthors (1986), for example, is predicated in part on the idea that vocational education should provide options for women, minorities, the disadvantaged, and the handicapped. Even with the large sample size of the HSB, however, they reported insufficient number of cases for some of the analyses with specific subsamples.

Noneconomic Effects

To date little empirical research has been reported with its primary objective being to assess noneconomic outcomes of vocational education. There do exist, however, a number of pertinent inquiries and commentaries. For convenience of presentation these are grouped into three categories. The first is the least precisely delimited. It consists of speculative commentaries and exploratory research studies that encompass a variety of postulated outcomes. The second is highly focused by comparison. It deals with the effect of vocational education on dropping out of high school. The third category embraces a large empirical literature on outcomes of high school curriculum and tracking. This work is pertinent because one of the tracks in these studies is defined by vocational curriculum.[1]

Commentaries and Exploratory Research

The idea that the benefits of schooling of any kind--academic or vocational--must be assessed against economic criteria is deeply embedded in American culture (see Spring 1976). Yet, confining attention to direct economic benefits measured by wage and hours differentials is unduly restrictive. Haveman and Wolfe (1984), for example, catalogue 21 potential noneconomic benefits of schooling. These include quality of child care, marital choice and stability, crime reduction, social cohesion, charitable giving, and capacity to learn. Haveman and Wolfe do not distinguish between academic and vocational schooling, but others have made specific claims regarding noneconomic benefits of vocational education (e.g., Farley 1979; Darcy 1980). One of the strongest claims for vocational education has been that it helps to prevent school dropout (Mertens, Seitz, and Cox 1982). The idea that vocational education options in high school act as preventive medicine against dropping out is a pivotal hypothesis. If vocational education serves this function, then part of the aggregate social benefits of nonvocational education may be due indirectly to availability of vocational education.

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[1] However, vocational and general tracks frequently are collapsed into a single category and compared to the college preparatory track.

Some have argued that the benefits of vocational education are not confined to jobs and wages but contribute to the well-being of vocational students and of the community in many other respects. For example, the Unfinished Agenda (National Commission on Secondary Vocation 1984) states five primary goals of vocational education:

> Broadly, vocational education should be concerned with the development of the individual student in five areas: (1) personal skills and attitudes, (2) communication and computational skills and technological literacy, (3) employability skills, (4) broad and specific occupational skills and knowledge, and (5) foundations for career planning and lifelong learning, (p.3)

Only one of these goals includes specific skill training (4). Two are indirectly related to economic outcomes (3,5), and the other two are as general as the goals of nonvocational education (1,2).

Farley (1979) compiled a list of 252 outcomes of vocational education derived primarily from written materials and frequently based upon statements of expected or desired, as well as observed, outcomes. Nearly one-third, 74 of the 252, referred to noneconomic variables. These were expressed in question form and included the following:

- Does participation in vocational education programs on the high school level contribute measurably to the moral development of students?

- By participating in vocational education, do students become aware of means by which they can continue their learning outside of the formal system of schooling?

- Does participation in vocational programs and affiliated youth organizations develop in youths a sense of responsibility for the welfare of others?

However, when Darcy (1980) reviewed a subset of these questions, or questions of a similar content, with a panel of experts, a question of occupational skill development was the only one upon which there was unanimous agreement. (Two other questions--both referring to schooling--achieved majority agreement.) Further, when another group of experts, representing a variety of disciplines, conducted yet another review of potential important outcomes, noneconomic outcomes were not included. This review was based upon an analysis of existing literature that reported evaluation evidence on the topic of vocational outcomes (McKinney and Fornash 1983).

Although research on outcomes of vocational education is poorly represented in the evaluation literature and not directly reflected in the law, the issue of noneconomic consequences of vocational education persists. A recent exploration of the elements of vocational program quality (Campbell and Panzano 1985) found nearly unanimous agreement among both secondary and postsecondary administrators, teachers, and students on the importance of such goals as positive interpersonal interactions, self-confidence, information finding skills, and societal improvement. Also, although most noneconomic outcomes are missing in the Carl D. Perkins Vocational Education Act, academic competency is specifically mentioned. Goodlad (1984) argues that vocational education should be provided to all students, not as a prerequisite to training related employment, but as an essential part of general education (pp. 147-148).

Silberman (1980) states the following rationale for broad outcomes of vocational education:

> In this viewpoint the primary purpose of vocational education is to promote full human development through exposure of the learner to activities that are intrinsically meaningful and absorbing. (p. 43)

Silberman identifies five dimensions of human development that vocational education should promote--sense of personal competence, aesthetic expression, integrity, cooperativeness, and altruism.

Woods and Haney (1981) conducted a broad assessment of vocational education outcomes. Their study was conducted under contract to National Institute of Education (NIE), which was mandated by congress to carry out such an evaluation. Consequently, Woods and Haney consulted the goals expressed for vocational education in federal legislation. They identified eight goals:

Gainful employment above the unskilled level;

Academic credentials for advanced technical education programs (below the baccalaureate level);

Occupational knowledge and skills;

Basic skills in reading, writing, and math;

Ability to cope with changes in jobs;

Long-term occupational advancement;

Years of schooling;

Employability skills. (p. 1-3-2)

Woods and Haney present an extensive review of past research and original analyses of national data sets to assess the degree to which these goals are met. The bulk of their work, however, is directed at the gainful employment outcomes. Their results regarding the noneconomic outcomes are inconclusive because of (1) inadequate data and (2) absence of strong patterns in available data.[2] Similarly, Grasso and Shea (1979) focus on economic outcomes of vocational education, but they also examine outcomes such as post-high school training and education and various psychological attitudes, including belief in adequacy of schooling, perceived economic well being, and perceived chance of reaching occupational goals. They found that a vocational program of study in high school depressed the amount of schooling completed after leaving high school, even after controlling for educational aspirations expressed while in high school. This finding held for the total sample of males and females when the contrast was to college preparatory students. Also, males in vocational programs reported less college than those in the general program when college prep students were excluded from the sample. This finding does not hold for women, however. Also, using self-reported curriculum, Grasso and Shea found that vocational students are less likely to be dissatisfied with their level of educational achievement than general students (except black males). Male vocational students expressed greater satisfaction with the progress of their career than did general students. Differences between vocational and general students on educational expectations measured after high school, satisfaction with their high school education measured after leaving high school, and perceived chance of realizing their occupational goals were negligible except that black male vocational high school graduates were substantially less optimistic about achieving their occupational goals than were black male general graduates.

Mertens and her coauthors (1980) report a comprehensive review of research conducted through 1979 on vocational education outcomes. They found mixed results regarding impacts of vocational education on labor market outcomes, with probably a slight

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[2] Their strongest finding is that business/commercial training improves the economic prospects of women. This is consistent with other research on the topic of economic benefits of vocational education.

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edge going to youth with vocational backgrounds. Their conclusions regarding noneconomic outcomes of vocational education are similarly ambiguous. For example, they state

> The results of the studies on basic skill attainment are mixed, and weaknesses in the studies prevent drawing any meaningful conclusions at this time, (p. 79)

Curriculum differences regarding attitudes toward schooling, feelings of success, and voting behavior also were found to be negligible. Mertens and her coauthors do conclude that educational and occupational plans of vocational students are lower than those of other students, however. But they do not discuss the knotty issue of distinguishing cause from effect in examining relationships between curriculum and career aspirations. For example, an association (or effect estimate) between college plans and vocational curriculum could arise because curriculum affects plans, because plans affect curriculum, or because of a combination of these two effects.

Numerous studies have investigated the impact of vocational education on basic skills. Two reviews of this work conducted at the National Center for Research in Vocational Education reveal overwhelming evidence that vocational students have lower test scores than academic students (Lotto 1983; Weber et al. 1982). Differences between vocational and general students are small by comparison. Although test score differentials between vocational and academic students are indisputable, the reasons for those differences remain very much in dispute. The key issue here is whether the differences are due primarily to selection or to differential learning. This question has been raised repeatedly in the literature (e.g., Wiley and Harnischfeger 1980; Alexander, Cook, and McDill 1978), but it remains unresolved. The present study takes important steps toward untangling the issue of effects of vocational education versus selectivity into vocational curriculum.

Dropout Prevention

Dropout prevention could be viewed as just one among many potential noneconomic outcomes of vocational education. There are two reasons for treating dropouts as a special case. First, there is a widespread conviction that keeping youth in school at least until they complete high school is important to the youth's welfare and to the general social welfare. Dale Mann (1986), for example, writes that "dropping out of high school is again nearing the much-to-be-desired status of a scandal in education" (p. 307). Second, the belief that vocationally oriented curriculum is instrumental in retaining youth in school also is pervasive among vocational educators. The Unfinished Agenda (National Commission on Secondary Vocational Education 1984) states the case as follows:

> The real strength of vocational education lies in its ability to motivate students....Many students report they would have dropped out of high school if they had not had the opportunity to take vocational courses in high school. (p.5)

Weber (1986) lists 10 reasons found in the literature why vocational education should, in theory, help to retain youth in school. These can be condensed into six reasons: relative to other curricula, vocational education (1) provides more active learning experiences; (2) provides more concrete, "hands-on" learning, (3) leads students to encounter more school learning that is clearly related to everyday life outside the school; (4) is conducted in smaller classes; (5) is more frequently updated to reflect current learner needs; and (6) provides better preparation for labor market entry (p. 5).

Several empirical investigations have addressed the impact of vocational education on dropping out. Weber's (1986) recent study uses the HSB data; two types of analyses in his research are pertinent. First, Weber examines bivariate differences between dropouts and "potential" dropouts regarding participation in vocational education. Few substantial differences in vocational course work are reported between dropouts and potential dropouts. Following Mertens, Seitz, and Cox (1982), Weber identifies potential dropouts via multivariate statistical analysis. Second, he reports a multivariate analysis in which the HSB schools form the unit of analysis. The dependent variable is the dropout rate calculated by aggregating values on the dropout variable for each student in the sample. The results of these procedures indicate a net positive association between the dropout rate and several indicators of the level of school participation in vocational education (e.g., percentage of students in T&I, whether auto mechanics is taught in the school, and whether the school offers a work experience program). Most of the partial correlations associated with vocational participation of the school are positive, but well over half (out of 46) are not statistically significant. These results are not, however, indicative of effects of vocational education because the calculations do not include controls for numerous factors that may affect entry into vocational education and the outcomes.

Mertens, Seitz, and Cox (1982) report statistical analyses from the National Longitudinal Survey (Youth) designed to assess the impact of vocational education on dropping out. They identify two critical barriers against accurate assessment. First, individuals who are prone to dropout also are likely to select vocational course work. Second, early dropouts by definition cannot have taken many vocational courses, especially in view of the fact that most vocational course offerings in secondary schools are available only in the 11th and 12th grades. Mertens and her coauthors handle the first problem in the following way. They first calculate a propensity to drop out using OLS regression.

Next they divide the sample into high- and-low propensity dropouts and conduct OLS regressions on the high propensity subsample, using many of the same regressors that were used to divide the sample. The second difficulty was handled by analyzing dropout separately for each of the last 3 years of high school and using course work regressors measured in the prior year. Mertens and her collaborators found that vocational credits in the prior year exhibit significantly negative effects on dropping out in the 10th and 12th grades but not in the 11th.[3]

Grasso and Shea (1979) report analyses of dropouts from the young men's and young women's National Longitudinal Survey (NLS-YA) data. Using self-reported vocational program, they found that vocational track membership reduced the likelihood of dropping out for white females, but the vocational track coefficients are not statistically significant for the other three race and sex combinations.

Woods and Haney (1981) report cross-sectional data from the NLS-Youth sample that show more vocational program students among high school graduates than among dropouts. Vocational program status was measured at the time of leaving school. Woods and Haney go to great lengths to point out the difficulty with cross-sectional data in this regard, however. The difficulty is that there is a net flow into vocational courses over the high school years (partially because many schools do not offer vocational courses until the 11th and 12th grades). Thus, measuring vocational program membership at the time of school leaving imparts a bias to the estimates of effects of vocational program on dropping out.

A massive literature has arisen in connection with the dropout problem; yet in spite of the pervasive view among vocational educators that vocational education helps to prevent dropping out, few studies not specifically designed to assess vocational education outcomes include any mention of vocational education. For example, of nine papers in a recent special issue of the Teacher's College Record (Spring 1986) devoted to dropout, only one pays any attention to vocational education (Hamilton 1976). Hamilton's paper is interesting in view of the paucity of research attention outside of vocational education paid to the influence of vocational studies on dropping out. Hamilton reviews a number of programs designed to prevent dropping out. In spite of the inconclusive nature of research on the topic, Hamilton finds that vocational education is an important component of most of the successful dropout prevention programs.

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[3] The authors speculate in this regard that insignificant coefficients in the 11th grade are due to a flood of youth dropping out who just reached the legal minimum age for leaving school.

Empirical Studies of Curriculum and Tracking

One important study from the National Center for Research in Vocational Education examines the effects of vocational curriculum on selected noneconomic outcomes. Campbell and Basinger (1985) report small and generally insignificant regression coefficients associated with vocational concentrator, limited concentrator, and concentrator-explorer where attendance at any postsecondary institution was the dependent variable. Their estimates rely on NLS Youth data and Probit analysis. Campbell and Basinger do find positive effects of academic curriculum on postsecondary attendance for all but minority males.[4] Given attendance at some postsecondary institutions, then the three vocational categories do exercise positive effect on attending a vocational or technical school for whites. The conditional equation (given postsecondary attendance) for attending a 4-year college or university shows the primary effects (positive) associated with academic high school curriculum.

A substantial research literature exists that investigates determinants and consequences of curriculum tracking in high school. Much of this work makes use of a trichotomous track variable defined by the usual three categories: academic track, vocational track, and general track. Since the outcomes of track in this work typically include test scores, educational plans, grades, and college attendance, the work is particularly pertinent to a broad investigation of noneconomic outcomes of vocational education.

One of the focal ideas at issue in the debate over tracking is as follows: status origins influence curriculum track in high school, and the curriculum track selected shapes the contours of future educational options. Since education is a critical factor in determining other status outcomes, tracking is a key institutional feature of schools that perpetuates a hierarchical stratification system. Much of the research on tracking appears to be stimulated by a model of this general form.

Rosenbaum (1976) argues that track systems in schools shape a number of outcomes, including measured IQ. The tracking system is analogous to a tournament; one may fail at any point by being placed in a nonacademic curriculum track. Once having fallen out of the academic track, it is virtually impossible to reenter it. Rosenbaum presents convincing evidence supporting this argument for one high school in Boston that he studied intensively. Being relegated to a nonacademic track led to discrimination in at least three forms: (1) repeated teacher insults, (2) diluted curriculum, and (3) application of a weighting system in computing class rank that was extremely biased against students in nonacademic tracks. Since colleges (at the time of the study) placed heavy weight on class rank, this procedure had important consequences. Virtually none of the students in a nonacademic track managed to enter a major college.

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[4] In the Campbell and Basinger analysis, respondents are classified as concentrator, limited concentrator, and concentrator-explorer only if they were in a training-related job. This procedure, it would seem a priori, should have generated some tendency for these categories to be related negatively to postsecondary attendance.

Conclusions similar to Rosenbaum's have been drawn by a number of investigators. Schafer and Olexa (1971) conducted comparative case studies of two midwestern high schools. The authors concluded that track has a pronounced effect on a number of outcomes, including failing grades, noninvolvement in extracurricular activities, misbehavior, dropping out, and delinquency. In another case study, Cicourel and Kitsuse (1963) also concluded that high school tracking often is unfair and detrimental to students. They observed, however, that a rigid ascription system does not characterize the operation of high schools. Rather, a complex bureaucratic system operates. Ostensibly the bureaucracy depends on a rationalized set of rules, but, in fact, decisions that strongly affect youths' futures depend on many diffuse criteria. The Carnegie Foundation report (Boyer 1982) provides independent, though anecdotal, evidence that nonacademic students receive inferior education. The report summarizes as follows:

> Vocational students are often academically shortchanged. This is, in fact, the most serious issue presented by the current tracking pattern. (p. 123)

Oakes (1982) also concludes that tracking is deleterious to the interests of those not in the academic track. She finds that teachers offer nonacademic track students a watered down curriculum that focuses on rudimentary basic skills rather than analytic skills, expect low performance and little homework from nonacademic track students, emphasize conformity for nonacademic students at the expense of problem solving, are unenthusiastic and lack clarity in class presentations in nonacademic classes, are punitively oriented toward nonacademic students, and spend little time in nonacademic classes on instruction. Further, she finds that nonacademic track students feel less respected by their peers and view peer relationships as more prone to conflict than do academic track students. Her conclusions are compromised, however, by lack of controls for measures of ability, achievement, and socioeconomic background.

Based on statistical analyses of survey data, papers by Alexander and his collaborators (1978) also support the importance of curriculum track in shaping outcomes such as grades in school (class rank), math test scores, characteristics of one's peers, and educational expectation (Alexander and McDill 1976). In additional work based on longitudinal data, Alexander, Cook, and McDill (1978) support Alexander and McDill. The 1978 paper examines effects of curriculum track on standardized achievement test score, educational expectation, and aspirations held by significant others for youth. In each case, lagged values of the dependent variables were entered as control variables, thus helping to confirm the effects of curriculum.

In a more recent analysis, Alexander and Cook (1982) reconsider the earlier conclusions of Alexander and his collaborators. Alexander and Cook examine track effects on educational expectation, test scores, grades, and college application. Introducing controls for course work pattern in junior high school, they find substantially reduced coefficients associated with track compared to track-effect estimates without these controls. Track effects persist on educational expectation, however. Alexander and Cook also find that course work pattern followed in junior high school has a dominant effect on track placement in high school. They conclude that thorough understanding of track effects requires data describing educational experiences prior to entering high school. If, however, Alexander and Cook had used high school course work in lieu of self-reported track, their conclusions regarding the direct importance of junior high school curriculum might have been different. It seems likely, as reported by Schafer and Olexa (1971) and Rosenbaum (1976) that junior high curriculum directly affects high school curriculum, and high school curriculum then has the most immediate impacts on outcomes such as test scores and career expectations.

Rosenbaum (1980b) shows that student perceptions of curriculum track often do not correspond to "actual" track. Actual track has a stronger effect on educational plans and college attendance than does perceived track. Perceived track plays a role as a mediator between actual track and college plans but has no important role in determining college attendance, once actual track is controlled.

Using HSB data, Gamoran (1986) reports statistical analyses of self-reported track on changes in test scores. He finds that the total effects of being in the academic track at time 1 are of the same order of magnitude as the effects of dropping out of school, and the total effects of track at time 2 generally are substantially larger than the effects of dropping out. His estimates indicate that the effect of time-2 track on math achievement is over three times the effect of dropping out. The impact of not being in the academic track on math achievement is by far the strongest effect of any track variable in Gamoran's statistical models.

In contrast to the studies summarized above, a number of scholars have argued that tracking is not a critical link in the stratification system. Rehberg and Rosenthal (1978) conclude that the independent effects of curriculum track in their upstate New York sample are modest and serve more as a mechanism for translating "merit" into achievement than for transmitting status between generations. Hauser, Sewell, and Alwin (1976) arrive at a similar conclusion--track is not a critical variable in determining outcomes related to status attainment. They find that the college prep curriculum exercises small effects on significant-other college expectations of youth, youths' college plans, youths' occupational plans, and college attendance. But Hauser and his coauthors conclude that the influence of grades is stronger than the influence of track and that grades function as a meritocratic mechanism in schools that dominates the hierarchical aspects of tracking. Of course, evidence from observational studies such as Rosenbaum's (1976) suggests that grades are not entirely "meritocratic." Heyns (1974), analyzing a subsample of the Equal Educational Opportunity data, concurs that track is not a critical determinant of outcomes related to status attainment. In an extensive review of the evidence, Jencks and his associates (1972) also agree that track is not a critical link in the socioeconomic attainment process.

CHAPTER 3

PROCEDURES

This chapter is divided into three sections. The first discusses conceptual issues related to the definition of vocational variables in the analyses. Section two addresses issues related to accurate theoretical depiction of dynamic processes related to vocational education and its outcomes and proposes a preliminary model to guide statistical analyses. The third section describes the methodology, including statistical methods and data sources.

Conceptual Issues

A number of definition and measurement issues regarding the meaning of vocational education must be resolved in order to proceed with empirical investigation. The most fundamental question is how to identify a vocational course. Campbell, Orth, and Seitz (1981), for example, note difficulties differentiating between occupational and nonoccupational home economics and between vocational and general typing. Generally, however, distinctions between vocational and other courses are made by school officials. It is impossible to obtain sufficient information from a survey or school transcripts to make an independent determination. Therefore, statistical analyses of effects of vocational course work necessarily address the following type of question: Do students who take many courses labeled vocational by school administrators differ with respect to some outcomes from those who take few such courses?

For users of existing survey data, issues related to the definition of a vocational course entail few short-run decisions. If one intends to study curriculum effects with such data, it is necessary to use administrators' definitions of curriculum. At least three more immediate conceptual-measurement issues arise: (1) whether to use self-report or transcript information, (2) whether to treat vocational courses as independent entities or attempt to cluster them into a program or track, and (3) whether to differentiate among vocational specialty areas. Each of these issues is discussed below.

Most research on curriculum effects has of necessity relied on student self-report of curriculum (e.g., Grasso and Shea 1979; Rehberg and Rosenthal 1978; Gamoran 1986; Meyer and Wise 1982; Alexander and McDill 1976). When both self-report and transcript information are available, large discrepancies between classification based on the two methods have been found (Woods and Haney 1981; Rosenbaum 1980; Campbell, Orth, and Seitz, 1981). Woods and Haney find particularly poor correspondence between self-report and transcript-based measures in the class of 1972 data. It should be noted, however, that the transcript measures in their data were not taken directly from the transcripts. Instead, the school questionnaire associated with the survey requested that the principal or other school official make the classification while referring to the student's transcript. It is likely that classification errors occur in this procedure because respondents had little incentive to do a tedious task carefully.

It would seem apparent that transcript data is preferable to student self-report. There are two reasons. First, transcript data are more accurate. Second, they are more detailed. Frequently, in fact, surveys simply ask students to indicate membership in one of three tracks: academic, vocational, and general. Nevertheless, Woods and Haney found that self-report track was a better predictor of labor market outcomes than transcript course work (as filtered through the school administrator). Additionally, a curriculum index defined from self-report of courses as a part of the present study exhibits unusually strong effects on many outcomes.

Most research on the outcomes of high school curriculum has relied on the trichotomous curriculum variable (academic, vocational, general) or a dichotomous collapsing of it (academic vs. vocational/general), (e.g., Gustman and Steinmeier 1981; Rosenbaum 1980b; Gamoran 1986; Alexander and Cook 1982; Grasso and Shea 1979; Rehberg and Rosenthal 1978). Often this operational definition is imposed by the available data, but whatever the reason for using this type of broad categorization, it implies that curriculum is experienced in bundles or packages--sometimes referred to as curriculum track or curriculum program. Two issues may be posed here. First, are there patterns of courses that, if taken as a track or program, exert influence on, say, scholastic achievement that could not be captured by a linear additive specification of the individual courses? Second, if so, is the trichotomy (academic, vocational, general) an adequate way to group courses into programs/tracks?

The most sophisticated effort to develop a vocational curriculum typology is reported by Campbell, Orth, and Seitz (1981). Their typology is intended to capture the degree of participation in vocational education and therefore remains undifferentiated with respect to nonvocational courses. The typology consists of six categories. These are arranged below in order of degree of participation in vocational curriculum.

Concentrator---------------11.0%
Limited Concentrator-------18.2
Concentrator/explorer------10.2
Explorer------------------ 1.5
Incidental/personal--------37.5
No vocational credits------21.7

The percentages are from the New Youth Cohort of the National Longitudinal Survey. (See Campbell, Orth, and Seitz 1981, p. 71).

Individuals are assigned to one of the six categories based on information taken from their high school transcripts. Transcript data on courses are used to create a profile for each case along five dimensions. These dimensions are intensity (number of vocational courses in one's vocational specialty, if a specialty exists), diversity (number of vocational service areas in which courses were taken), continuity (number of grades in which the same specialty was pursued), supportive diversity (number of nonspecialty credits in a "related" service area), and proximity (scored high for credits taken late in high school and low for credits taken in early high school). Individual respondent profiles are compared to an ideal profile assigned to each category in the typology. Respondents are assigned to the category that has an associated ideal profile of least Euclidean distance from their individual profile. The ideal profiles were assigned as a result of judgments. These judgments were based on the following qualitative principles: concentrators should exhibit high intensity, low diversity, high continuity, moderate supportive diversity, and high proximity. Limited concentrators should exhibit a similar profile but with somewhat less intensity and continuity and somewhat more diversity. Concentrator/explorers should exhibit moderate intensity and continuity, fairly high diversity, and low proximity. Explorers should be high in diversity and low on everything else. Incidental/personals should be low on diversity and zero on everything else. The category of no vocational courses is self explanatory.

Using the Patterns of Vocational Participation created by Campbell, Orth and Seitz (1981), Campbell and coauthors (1981) find strong positive effects of being a vocational concentrator on labor market outcomes--provided that the job was related to one's training program. Studies of economic outcomes of vocational education generally have relied on a modified version of the six categories just described. Campbell et al. (1986), for example, use dummy variables for concentrator, limited concentrator, and concentrator/explorer categories. They also include a dummy variable for academic curriculum, based on transcript data. The comparison category is the "general" curriculum; it is defined as a residual.

The seven standard high school vocational service areas comprise still another way of categorizing vocational courses. Relatively little work has been reported in which explicit distinction among the service areas is included. However, Woods and Haney (1981) show that business and office for women and trade and industry for men are more adequate indicators of the effects of vocational curriculum than is the undifferentiated vocational track.

The most straightforward way to study effects of vocational education is to use the number of vocational courses or vocational credits, either as a raw number along with courses or credits in other subjects or as a percentage of total credits. When Woods and Haney approximated this procedure, they found self-report vocational program (commercial for women, T&I for men) to be a better predictor of labor market outcomes than undifferentiated vocational track. Daymont and Rumberger (1982) also used number and percentage of total credits that were vocational, finding that vocational and academic credits are of about equal value in the labor market. They also found that credits taken as part of a program related to one's job had stronger positive labor market effects than other vocational credits.

It is clear from this brief review of conceptual considerations and operational procedures that no single best conception of how to define exposure to vocational education in high school has emerged. Therefore, this report will conduct analyses with more than one set of procedures. Three types of measures will be used. Primary reliance will be placed on the patterns typology created by Campbell and his coworkers. This emphasis is maintained because the patterns typology is the most sophisticated summary of exposure to secondary vocational education and to preserve continuity with the accumulation of research on vocational education effects conducted at the National Center for Research in Vocational Education. The version of the typology used in this report will be defined by dummy variables for concentrator, limited concentrator, concentrator explorer, and academic, as described previously. The second type of variable will be the standard trichotomous self-report variable. The third type of variable will be a curriculum index based on courses taken, as reported by the respondent.

Data

Two data sets will be used for the statistical analyses: (1) the High School and Beyond (HSB) and (2) the National Longitudinal Survey of Labor Market Experience New Youth (abbreviated as NLS). The HSB was funded by The National Center for Education Statistics (now the National Center for Statistics), and data were collected by NORC. The NLS was carried out by the Center for Human Resource Research with financial support from The United States Departments of Labor and Defense. NORC also collected the NLS New Youth data.

The HSB consists of two cohorts. The younger cohort is comprised of 30,000 youth who were high school sophomores in 1980, and the older cohort is comprised of 28,000 youth who were seniors in 1980. For simplicity these cohorts will be identified in this report as the sophomore cohort and senior cohort, respectively. The basic sampling unit of the HSB data is the school (1,015 in the sample). Schools were stratified along several dimensions, including race, ethnicity, and public-private ownership.

Data collection on both cohorts was initiated in 1980. Two follow-ups have been completed, one in 1982 and one in 1984. Base-year data collection included extensive questionnaire data, scholastic achievement test scores (tests constructed by ETS especially for the HSB), and a school questionnaire. The first follow-up for the younger cohort included a repeat of most questionnaire items and retesting. For the older cohort the first follow-up questionnaire was revised to reflect changed circumstances after leaving high school. No retesting was conducted. The first follow-up questionnaire focuses on labor market experience, post-secondary schooling, and family formation. A subsample of about 11,000 was included in the first follow-up of the older cohort. The second follow-up questionnaire for both cohorts concentrates on labor market, schooling, and family variables; no retesting was conducted. The second follow-up of both cohorts is a subsample. For the older cohort, the same subsample as for the first follow-up was resurveyed a second time. About 14,000 cases comprise the second follow-up of the younger cohort.

In addition to the survey and test data, high school transcripts were assembled for about 15,000 members of the younger HSB cohort. These data also were collected by NORC under contract from NCES. The transcripts contain the following information for each course taken by the student: (1) a six-digit identification code, (2) year and semester course was taken, (3) credits earned, and (4) grade. In addition, transcripts contain class rank, grade point average, number of days absent, number of days suspended, date and reason the student left school, and standardized test scores and a code identifying the type of the test. Since this study makes use of transcript data, and no transcript data were collected for the senior HSB cohort, analyses in this report are based on the sophomore cohort data.

The NLS contains 12,686 youth selected through households rather than schools. These youth were aged 14-21 in 1979, the base year of the survey. Yearly follow-ups through 1985 are now available. The sample is stratified by race, ethnicity, sex economically disadvantaged, and military status. Extensive questionnaire information form part of the database. This includes background data on family of origin, high school experience, labor market experience, post secondary, schooling, family (of destination) information, and attitudes (see Borus et al. 1980).

High school transcripts were also collected for most NLS sample members (those in the military sample and foreign high schools excluded). Transcript data collection was carried out by the National Center for Research in Vocational Education with financial support of the United States Department of Education. Transcript information includes (1) specific courses taken (subject, grade, credits, year and semester taken); (2) days absent (grades 9-12); (3) class rank; and (4) test scores.

Detailed information describing respondents' career expectations, homework, and attitudes in early high school for older members of the sample are not available. Further, the test score data that are available were collected once, in 1981. The timing of the test administration has important implications for interpretation of results, as will be discussed later.

Variables

Although there is general agreement that some variables such as test scores and educational expectation belong in a model of curriculum effects, no consensus has developed regarding the full complement of variables that should, at minimum, be included. Case studies generally note that a large number of diffuse criteria enter into the selection of courses (Rosenbaum 1976; Cicourel and Kitsuse 1963; Oakes 1985). Statistical studies show that achievement and ability test scores exercise strong influence on selection of curriculum track, socioeconomic background manifests modest effects, but that most students believe that they personally chose their track (Rehberg and Rosenthal 1978; Heyns 1974; Alexander and McDill 1976; Alexander and Cook 1982; Jencks et al. 1972). One conclusion is clear from theory and past research--a large number of potential outcomes of curriculum also may influence it. Therefore, it is imperative to control for many potential confounding factors if conclusions are to be secure. The structure of the HSB data differs from that of the NLS. Consequently, the selection of variables from the HSB differs from the selection in the NLS. HSB variables are described first, then the NLS. Variable names used as identifiers on all tabulations, variable definitions, means, and standard deviations are given in the appendix for all variables.

HSB variables

Twenty-four endogenous variables, other than vocational courses, were selected from the HSB sample. These include four standardized tests--verbal test score (combined HSB reading, writing, and vocabulary), math test score (two HSB math tests combined), science test score, and civics test score; two measures of career expectation--educational expectation and occupational expectation; perceived ability to complete college; five attitudinal variables--self-esteem, locus of control, community values, work values and "altruism"; one index of school deportment (high values indicate "misbehavior" in school); grades (self-report GPA on a 4-point scale); amount of time per week spent on homework (in hours); seven measures of significant other expectations/aspirations or characteristics--mother's educational expectation of the youth, mother's college aspiration for the youth, father's college aspiration for the youth, teachers' college aspiration for the youth, counselor's college aspiration for the youth, friends' and relatives' college aspirations of the youth, and friend's college plans; an index of time spent with friends; and one measure of type of friends with which one associates.

The index of deportment includes the following six items, all standardized prior to averaging: days absent from school but not sick, days tardy to school, cutting classes, disciplinary problems at school, suspended from school, and trouble with the law. Type of friend was defined as an index of three items--whether best friend gets good grades, whether best friend is interested in school, and whether best friend attends classes regularly; each component is a binary variable scored 1 for yes and 0 for no.

The use of test scores is so pervasive in the literature on curriculum effects that it needs no additional justification here. Likewise, career plans are universally viewed as important potential outcomes of curriculum. Both test scores and career expectations affect future career options; therefore, effects of curriculum on these variables potentially are important to future achievements. A strong case for inclusion of the three attitudinal indexes can be made. Two views may be argued with respect to probable effects of vocational curriculum on attitudes such as self-esteem and locus of control. First, justifications for supporting vocational education argue that specializing in vocational education should help improve self-esteem and locus of control, because vocational courses offer students alternatives that permit them to be successful. Forcing everyone into an academic curriculum generates an unnecessarily large number of "failures" (Silberman 1980). On the other hand, many argue that attitudes such as self-esteem and locus of control are depressed by vocational track. Observational studies (in contrast to surveys) report that students in nonacademic curricula are exposed to indignities from teachers and peers. If critics of schooling such as Bowles and Gintis (1976) are to be believed, then work values of those in the nonacademic track should be strengthened. Grades also affect options for admission to college and frequently have been used in past studies of curriculum. One of the frequent observations of case studies is that few demands are made of nonacademic students (e.g., Oakes 1982; 1985; Boyer 1982; Finley 1984; Rosenbaum 1976). Inclusion of homework as a potential outcome of curriculum reflects, in part, this observation. Since significant others have universally been found to exercise strong influence on career plans of youth (e.g., Hauser, Tsai, and Sewell 1983), the inclusion of these variables is indicated.

Control for socioeconomic background and personal characteristics is also important in evaluating curriculum effects, since variables such as SES, race, and ethnicity affect curriculum choice and potential outcomes of curriculum. Exogenous variables in the HSB analyses include region dummy variables, race, ethnicity, father or male guardian in the household, mother or female guardian in the household, family income (log), and a status index composed of the following elements: father's occupation (Duncan), father's education, mother's occupation (Duncan), mother's education, number of siblings, proportion of possessions out of a list presented to respondents, home ownership, and number of rooms in the home. All these variables were measured by the student's report. A missing data dummy for family income was included in the regressions, but its coefficients are not reported in the tables. Also, dropout status was controlled in all equations for which the dependent variables was included on the dropout questionnaire (half of the outcomes).

Three types of outcomes are included from the second follow-up of the HSB sophomore cohort: schooling, marriage and family, and voting behavior. These variables were measured 2 years following high school (for respondents who finished on schedule). Four schooling variables are included: enrollment in a 4-year college or university at the time of the second follow-up, enrollment in a 2-year junior or community college at the time of the second follow-up, enrollment in a vocational or technical school at the time of the second follow-up, and the amount of time since high school (1982) enrolled in any postsecondary school. Four measures describing marriage and family are included: marriage since high school, separation from a marriage since high school, becoming a parent since high school, and number of children born since high school.

NLS variables

The NLS sample does not include the rich assortment of variables describing respondents' early high school period that is contained in the HSB. Lack of this information stems in part from the fact that many NLS respondents were not in high school at the time of the base-year interview (1979). Only three of the eight cohorts were in junior high or early high school (sophomore or earlier) in 1979. This means that questions about educational and occupational expectations did not refer to early high school for most of the NLS respondents. This is an important aspect of the NLS data because of the need to control for these variables at "intake" into a curriculum. When measures taken at a later date are used as controls, they very likely mask part of the total effects of curriculum. For example, if, in an equation for college attendance, one controlled for educational expectations of those who were 19 in 1979, effects of curriculum that operate through influence on educational expectation would be removed from the estimates. This problem is even more acute for those who were 21 in 1979, because their educational expectations very likely would be heavily influenced by their educational attainment to date. Entirely parallel difficulties arise in connection with occupational expectation. Because of these difficulties regarding timing of measurement, neither educational nor occupational expectation are included in most of the NLS analyses. Limited analyses of post-high school educational outcomes are conducted with only the younger three NLS cohorts. These calculations do include career expectation variables as controls.

A similar problem occurs with the NLS test-score data. These data were collected in 1981. This fact means that it is impossible to control for test scores at "intake" into one's high school curriculum for many of the NLS respondents. Controls for test scores are nevertheless included in the analysis of NLS data, on grounds that test scores are more stable over time than, for example, educational expectation. It must, however, be noted that the test scores very likely are affected by high school curriculum. Analysis with the HSB data strongly supports this view. Four ASVAB tests are included, a verbal test score, a math test score, a science test score, and a technical test score.

Twenty exogenous control variables were included in the NLS analyses. These are rural residence at age 14, urban residence at age 14, gender, member of the black race, Hispanic ethnicity, age, mother in household at age 14, stepmother in household at age 14, father in household at age 14, stepfather in household at age 14, mother's occupation (Duncan) when the respondent was 14, mother's education in 1979, father's occupation (Duncan) when the respondent was 14, father's education in 1979, number of siblings, and whether the interview was conducted in a language other than English.

All outcome measures from the NLS sample are post-high school measures. They fall naturally into 4 categories: education and training, marriage and family, substance use, and crime. There are nine education and training variables: attendance at a 2-year college, completion of a 2-year college degree, amount of schooling completed (approximate years), government training received, government training completed, received other training, and other training completed.

There are eight marriage and family variables: married since high school, became a parent since high school, number of children since high school, DPT shots for one's youngest child, measles shots for one's infant, prenatal care, "well baby care" during the first year, and the month of a pregnancy in which one first received prenatal care. The latter five variables are defined only for females who had a baby in 1982 or 1983.

Twelve measures of substance use are examined: number of cigarettes smoked per day in the month prior to the interview, an index of alcohol use in 1983, an index of alcohol use in 1984, number of times smoked marijuana in the year prior to the interview (measured in 1980 and 1984), number of times sold other drugs in the year prior to the interview, life time use of marijuana, life time use of other drugs, number of times smoked marijuana in the month prior to the interview, and number of months since the base-year interview smoked marijuana.

There are four measures of criminal behavior. These are an index of nonserious criminal offenses, an index of serious criminal offenses, percentage of income obtained by illegal activities, and number of times stopped by police in the year prior to the interview.

Models and Method of Analysis

There are dozens of ways that could be used to analyze a given set of data. Generally the qualitative nature of the conclusions is not influenced very much by the choice of statistical methodology (e.g., OLS, probit, logit) so long as the same variables are used with the different statistical methods.[5] On the other hand, the choice of control variables and the operational definition of variables--especially the dependent variable--often have a strong impact on the results. A critical aspect of the specification of independent variables in longitudinal data is whether to include as predictors any variables measured at the same time point as the dependent variable. Whether or not one does so often has dramatic impact on substantive interpretations. In this report only time-lagged measures of independent variables are included. This strategy is based on a fairly elaborate conception of the manner in which the processes under study here operate over continuous time. A summary of the rationale follows.

Social scientists seldom if ever know the precise length of time it takes for effects of one variable on another to occur. It can safely be assumed in most cases, however, that the spacing between measurements in longitudinal data does not correspond to the length of the "causal interval." Consequently, questions immediately arise regarding appropriate use and interpretation of statistical models in conjunction with available data. For example, if one believes that effects of x on y and of y on x occur over a short time relative to the length of time between measurements, should the statistical specification include the current value of x as a predictor of the current value of y, and vice versa? If so, then some non-OLS statistical estimation method probably is indicated. This type of reasoning is often used to justify statistical specifications with "simultaneous" feedback, yet a reasonable model of simultaneous feedback operating over continuous time indicates otherwise (See Tuma and Hannan [1984] for a clear statement of this line of reasoning). In the following paragraphs a differential equation model of a system of variables permitting all feasible feedback effects among endogenous variables is sketched. This model does not precisely describe any of the substantive analyses to be conducted in this report, but it does lead to a working principle on use of time sequencing that will be followed in the report.

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[5] In contrast, comparison of OLS results to simultaneous estimation methods such as two-stage least squares often does generate substantial differences. Use of the simultaneous estimation methods, however, always imply some changes in specification of variables with direct effects on the outcome, because of the need to exclude enough right-side variables to bring the model to the point of being "identified."

The model depicts the rate of change in several outcomes as a linear functions of J exogenous variables and K endogenous variables. The first equation in the system is typical of the others; it assumes the following form:

$$(1)\ \frac{dy_1}{dt} = a_{10} + a_{11}x_1 + \ldots + a_{1J}x_J + b_{11}y_1 + b_{1K}y_K + c_1\ VE$$

where y_1 = dependent variable (e.g., verbal test score, educational expectation, self-esteem), dy_1/dt = instantaneous change rate in y_1 with respect to time (derivative of y_1 with respect to time), x_j = exogenous variables (assumed constant over time), y_k = endogenous variables -- jointly dependent, VE = underlying continuous variable for which vocational curriculum variables are proxies, and a_{kj}, b_{jj}, c_k = constants. The notation for vocational education (VE) is distinct from that for the other jointly dependent variables, to emphasize the focus on curriculum in this report. In many of the analyses, academic curriculum also will be included, but the general principle of equation (1) is not affected by this expansion.

The solution to the set of equations typified by (1) is a set of linear equations, a typical member of which assumes the following form:

$$(2)\ y_k(2) = a^*_{ko} + a^*_{k1}x_1 + \ldots + a^*_{kJ}x_J + b^*_{k1}y_1(1) + \ldots + b^*_{kK}y_K(1) + c^*_k\ VE$$

The notation y(1), y(2) stands for observations on the dependent variable at time 1 and time 2, respectively. The coefficients marked with an asterisk are functions of the coefficients in the differential equations (1) and of the length of time between measurements.

From equation(s) (2) it is apparent that, with the simultaneous model of instantaneous change rates (eq. [1]), the appropriate regression structure is a cross-lagged specification. It is important to emphasize the conceptual basis of this result. The effects are hypothesized to be simultaneous (i.e., lag time between cause and effect ---> 0). Moreover, all possible feedback effects among the endogenous variables are permitted. According to the maintained hypothesis, these effects operate continuously over the time between measurements to produce the cross-lagged structure of which equation (2) is one component. Despite the presumption of instantaneous effects, the model implies that no time 2 measurements are included as independent variables.[6]

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[6] If some of the exogenous variables change linearly over time, change in x as well as lagged x may be included as a regressor (Coleman 1968; Tuma and Hannan 1984). For simplicity, we here assume that all the exogenous variables are fixed over time. It is interesting to note, however, that even if the exogenous variables are permitted to be linear functions of time, it is possible to derive a specification of the regression that omits any use of

This is an important point regarding appropriate specification of regression models that generally is not well understood. It is worth noting that the regression coefficients estimate the accumulated total effects over a specified time interval, not the instantaneous effects.

The regression coefficients in the cross-lagged structure are exponential functions of time between measurements. Hence, estimates of the effects of curriculum on post-high school outcomes depend on age in a nonlinear form. The regression coefficients themselves are exponential functions of age. This result has important implications for the NLS sample, but in this exploratory report we simple enter age as a linear term in the NLS analyses.

The differential equations do not adequately describe change in curriculum, because curriculum shifts occur abruptly, and the model describes smooth changes. Moreover, curriculum undoubtedly depends on many of the 20 outcomes under study here (as well as partially determining them). Hence, the model ought to describe a system in which some of the endogenous variables change continuously over time, and some of them are categorical and change abruptly. The need for such a model is even more acute when outcomes include post-high school variables such as college entry and exit, marriage, parenthood, and educational expectation. An adequate conceptualization of a general change model that combines both discrete and continuous endogenous variables in a single simultaneous system has not appeared yet in the literature, and such development certainly lies outside the scope of this report.

Tuma and Hannan (1984) review three possible approaches to "coupling" endogenous quantitative and qualitative variables into a single system of equations describing change over continuous time. One approach is to create categorical variables from all variables in the system by establishing a small number of (ordered) categories for each numerical variable. A second approach is to create approximate numerical variables from categorical variables by assigning numbers to the categories of the qualitative variables. This method requires that some rough order be established among the categories of the qualitative variables. The third method is to write differential equations connecting numerical variables and transition rates describing the stochastic processes that determine shifts from one qualitative state to another. The latter approach is, by far, preferable from a theoretical and methodological standpoint, but its implementation currently poses so many practical barriers as to render it virtually impractical in ongoing empirical research. This paper adopts method two.

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the time 2 measures of the x's. This omission would be one way to resolve the ambiguity that arises from the over-identification implied by including the change in x on the right of the regressions. Also, any use of the theoretical model for forecasting purposes necessarily would have to depend solely on the lagged values of the x's.

Though the differential equation system does not provide an exact model of the processes under study here, it does indicate three working principles that will be used to specify regressions for this report. First, whenever possible, a time lag between the measurement of a dependent variable and independent variables should be present. Resulting regression coefficients estimate accumulated effects over relatively long time periods rather than instantaneous effects of the differential equation (1). Second, time-lagged values of the dependent variable should be included among the regressors whenever possible. For example, sophomore educational expectation should be one predictor of senior educational expectation. Three, time-lagged values of all endogenous variables should be included as regressors whenever possible.

On adding a disturbance to equation (2), the constant parameters in each equation can be estimated with linear regression (Coleman 1968; Doreian and Hummon 1976; Tuma and Hannan 1984) or by maximum likelihood (Arminger 1983). As in the general case, OLS regression will produce biased and inconsistent estimates of the starred coefficients in all the models presented here unless the disturbances are uncorrelated with all regressors in each equation (Judge et al. 1982). Such an assumption is particularly hard to entertain with respect to the lagged dependent variable (Hannan and Young 1977), but there are few practical alternatives to OLS unless more than two waves of data from a panel are available. The possibility of deriving maximum likelihood estimates from an explicit specification of a system of stochastic differential equations appears remote given the present level of understanding of simultaneous stochastic differential equations (Tuma and Hannan 1984). The estimates presented in this paper are OLS. The regressions for in-school HSB outcomes were carried out from correlation matrices that were computed by the pairwise present method. All other regressions were carried out by deleting cases in which the dependent variable was missing and substituting mean values for missing independent variables or by linewise deletion. Missing data dummies were used in some, but not, all cases. Means were never substituted for missing values of the dependent variable.

Several of the dependent variables studied here are dichotomous and some have skewed proportions (e.g., married since high school for the HSB sample). Consequently, OLS estimates are inefficient and yield biased sampling error estimates. In addition, predicted values from OLS estimates may fall outside the 0-1 range. Experience indicates, however, that non OLS methods such as probit or logit seldom change substantive conclusions. Moreover, they are much more expensive to use and entail conceptually more difficult interpretation. Nevertheless, probit calculations were carried out with all dichotomous post-high school outcomes in the HSB data. Selected results are reported in appendix B. In every case, the pattern of signs and statistical significance on the probit results exactly matches those on the OLS and the relative magnitudes of coefficients in probit are similar to those in OLS.

A number of regressions can be viewed as a reduced form, for example when college entrance is the dependent variable. In these regressions, curriculum and the other high school variables that are endogenous with curriculum become predetermined with respect to college entrance. Consequently, with the HSB data only base-year measures of the endogenous variables are controlled when post-high school outcomes are studied. To control the first follow-up measures would be to control some of the outcomes of curriculum, thereby masking part of the total effect of curriculum.

This report makes use of indexes of socioeconomic background, curriculum, and significant others' career aspirations for respondents. These indexes are not proposed as imperfect indicators of a latent factor, as in classical test theory or LISREL modeling. Rather, they are used as convenient devices for summarizing effects of conceptually related variables. However, regression coefficients associated with indexes of this type can be given precise interpretation. They indicate the effect of simultaneously incrementing each component of the index one unit while holding constant all variables not included in the index, under the constraint that all components of the index have the same size effect on the outcome. When components of the index are standardized prior to calculating index values, this interpretation applies to the standardized units. If the index were calculated as an average rather than a sum, then the units are 1/J times the original units (J being the number of components in the index). Of course, the equality constraint on the coefficients may not hold in fact. Even if it doesn't, however, an index can often reveal important patterns in data that otherwise would be concealed or difficult to detect. Use of the curriculum index in this study illustrates how use of an index can help to identify dominant patterns in data.

CHAPTER 4

FINDINGS

The findings of the study are organized according to data source and type of outcome. The first section of the chapter analyzes outcomes measured during the last year of high school for the HSB sample. The dependent variables include test scores, grades in high school, homework time, career plans, and attitudes. Section 2 extends this analysis to include outcomes for HSB respondents measured 2 years out of high school. Outcomes for this section include postsecondary schooling, family formation and parenthood, and voting behavior. The third section analyzes several outcomes from the NLS Youth data. These outcomes are classified into 4 types: postsecondary schooling, family formation and parenthood, crime, and drug use.

Throughout the discussion of findings the term effect is used as a matter of convenience. Since the analysis has attempted to control for many potentially confounding factors, the term effect seems preferable toterms such as association or relationship. Yet it is critical to keep in mind that what are termed effects in the following pages are highly imprecise estimates. In this feature they do not differ from the vast majority of social science research, but that fact most social science research is imprecise does not make the results reported here any more precise than they otherwise be.

In-School Outcomes for the HSB Sample

It is widely known that persistent differences between vocational students and other students occur along an array of in-school outcomes. This fact is documented in table 2. The table displays the mean value for 24 variables. Each of these 24 variables undergoes important development during the high school years; as shorthand notation they are referred to as in-school outcomes. The first panel of the table presents first follow-up outcomes (respondents' senior year in high school). It shows substantial differences among the five curriculum categories on most of the outcomes. Differences are particularly strong for test scores (VERBAL2 & MATHSD22), career expectations (EDASP2 & OCCASP2), ability to complete college (COLABL2), grades (AVGRAD2), homework (HOMWRK2), parents' and friends' career aspirations for the respondent (EDASPM2, MAHSCOL2, FAHSCOL2, TAHSCOL2, GAHSCOL2, FRAHSCOL2, and peer friends' college plans (CFPLCL2). For each variable, those in the academic category average well above the others and those in the general category generally average second highest. Distinctions between the concentrators and concentrator/explorers are small. The pattern involving the vocational concentrators is interesting. The concentrators average lowest on educational expectation, occupational expectation, perceived ability to complete college, verbal test score, math test score,

TABLE 2

MEAN DIFFERENCES AMONG CURRICULUM TYPES ON 24 VARIABLES: HSB DATA

Panel 1: First Follow-up Measures

	VERBAL2	MATHSD22	SCINSD22	CIVCSD22	EDASP2	OCCASP2	CONCPT2	LOCUS22
PRGENRL	53.5544	52.0927	51.9484	54.0864	15.1604	52.4328	3.9747	3.6371
PRCONCD	51.2156****	48.6886****	49.7417****	51.9469****	14.0104****	47.0346****	3.9368*	3.5356****
PRLCONCD	52.5341****	50.9571****	51.0499****	53.5318*	14.6621****	49.6644****	3.9636	3.5891**
PRCONEXD	52.1680****	50.5306****	50.5994****	52.9942****	14.7559****	50.2688***	3.9610	3.5725**
PRACADD	63.8385****	64.2922****	61.5378****	62.0254****	17.7319****	63.5582****	4.1190****	4.0490****
ADJ R-SQ	0.0386	0.0518	0.0305	0.0206	0.0541	0.0146	0.0018	0.0105
NO./CASES	13312	13312	13312	13312	13312	13312	13312	12381

	WORKVAL2	INSEEQ2	COMMUN2	COLABL2	AVGRAD2	HOMWRK2	EDASPM2	MANSCOL2
PRGENRL	2.6430	1.7761	0.5570	4.3848	2.8747	5.0598	15.9421	0.7561
PRCONCD	2.6500	1.6717****	0.5408	4.0751****	2.8321*	3.5999****	15.0234****	0.4896****
PRLCONCD	2.6671**	1.7343**	0.5009	4.2365****	2.7770****	4.1068****	15.5511****	0.6495****
PRCONEXD	2.6284	1.7568	0.5618	4.2376****	2.7699****	4.3093****	15.6125****	0.6477****
PRACADD	2.6402	1.8176	0.2099**	4.8376****	3.3966****	8.1146****	17.6819****	0.9614****
ADJ R-SQ	0.0010	0.0023	0.0004	0.0259	0.0203	0.0339	0.0356	0.0457
NO./CASES	12521	12369	13312	13312	13312	13312	13312	11132

	FAMSCOL2	TAMSCOL2	GAMSCOL2	FRAMSCL2	CFPLCL2	TIMWFRM2	TYPFRM2	SMDEPRT2
PRGENRL	0.6746	0.5827	0.6239	0.6300	0.7986	2.7979	0.8477	0.4965
PRCONCD	0.4170****	0.3853****	0.4313****	0.3675****	0.6053****	2.8714	0.8131****	-0.0911****
PRLCONCD	0.5624****	0.4790****	0.5065****	0.4936****	0.7154****	2.8788*	0.8367	0.0057****
PRCONEXD	0.5600****	0.4828****	0.5216****	0.5033****	0.7135****	2.8078	0.8311*	0.1138**
PRACADD	0.9035****	0.8355****	0.8489****	0.8907****	0.9325****	2.6723	0.8896**	-0.8577****
ADJ R-SQ	0.0414	0.0294	0.0288	0.0460	0.0272	0.0006	0.0025	0.0040
NO./CASES	11062	11061	11063	11102	11109	11349	11197	13172

Table 2 -- con't.

Panel 2: Base Year Measures

	VERBAL1	MATHSD21	SCIMSD21	CIVCSD21	EDASP1	OCCASP1	CONCPT1	LOCUS21
PRGENRL	50.6689	50.5786	50.1739	50.5330	15.1322	53.0109	3.8081	3.4943
PRCONCD	48.2231****	47.9189****	48.4137****	48.5451****	13.9204****	46.4075****	3.7657*	3.4321**
PRLCONCD	49.3889****	49.5533****	49.2598****	49.9401**	14.6934****	50.5143****	3.7874	3.4293***
PRCONEXD	48.8056****	48.9240****	48.8115****	49.3935****	14.6370****	50.6017****	3.7653*	3.4144****
PRACADD	60.2561****	60.5564****	59.1397****	57.7652****	17.6817****	62.0654****	4.0028****	3.8900****
ADJ R-SQ	0.0430	0.0422	0.0271	0.0198	0.0480	0.0166	0.0033	0.0098
NO./CASES	13312	13312	13312	13312	12792	13312	12779	12747

	WORKVAL1	INSEEQ1	COMMUN1	COLABL1	AVGRAD1	HONWRK1	EDASPN1	MAHSCOL1
PRGENRL	2.6421	1.8024	2.0563	4.0243	2.6772	4.3797	15.9921	0.7008
PRCONCD	2.6391	1.7714	2.0291*	3.7847****	2.7092	3.4881****	15.0016****	0.5112****
PRLCONCD	2.6499	1.8143	2.0802*	3.9[illegible]39*	2.6874	3.9302****	15.7594****	0.6673**
PRCONEXD	2.6302	1.8419*	2.0803	3.9132***	2.6690	3.6504****	15.6615****	0.6412****
PRACADD	2.6755	1.8091	2.0343	4.7055****	3.4233****	7.0304****	17.5637****	0.9515****
ADJ R-SQ	0.0003	0.0003	0.0010	0.0169	0.0198	0.0267	0.0307	0.0237
NO./CASES	12877	12674	12841	12512	13185	13156	13312	12789

	FAHSCOL1	TAHSCOL1	GAHSCOL1	FRAHSCL1	CFPLCL1	TIMWFRN1	TYPFRN1	SMDEPRT1
PRGENRL	0.6158	0.3381	0.3278	0.4410	0.6993	1.5888	0.8042	0.0807
PRCONCD	0.4223****	0.2313****	0.2100****	0.2886****	0.5715****	1.5872	0.8052	-0.6438****
PRLCONCD	0.5735***	0.2927****	0.2801****	0.3921****	0.6869	1.5744	0.8151	-0.6473****
PRCONEXD	0.5351****	0.2886***	0.2696****	0.3747****	0.6382****	1.5904	0.8006	-0.3591****
PRACADD	0.8939****	0.5705****	0.5065****	0.7267****	0.9186****	0.9931****	0.9129****	-1.7859****
ADJ R-SQ	0.0246	0.0127	0.0116	0.0193	0.0139	0.0038	0.0033	0.0121
NO./CASES	12777	12516	12624	12814	12660	13066	12958	13296

Note: Probabilities are for comparisons to the general curriculum (PRGENRL).
* p < .05 ** p < .01 *** p < .001 **** p < .0001

and homework hours per week. On the other hand they do not average much below the other groups on self-esteem (CONCPT2), (internal) locus of control (LOCUS2), and grade average (AVGRAD2).

Of course it would be unfair in the extreme to conclude from the top panel of table 2 that academic education produces desirable outcomes and vocational education does not, because vocational students average below the academic students before they took very much vocational or academic coursework in high school. The bottom panel of table 2 documents this well-known result. Using the same outcomes as in the top panel but measured during respondents' sophomore year in high school, a pattern of differences on the 24 outcomes nearly identical to results in the top panel of the table is revealed. Comparison between the two panels shows dramatically the need for extensive statistical controls, as argued in chapter 3, when one is attempting to identify differences on these outcomes that are produced by curriculum differentiation.

A large number of variables potentially may influence the in-school outcomes analyzed here and selection into vocational curriculum. Campbell, Gardner and Seitz (1982) document the influence of background on curriculum, and table 3 shows estimates of effects of selected background variables on the full complement of in-school outcomes. The dropout (DROPOUT2) variable is included on the first part of the table only, because outcomes in the second part of the table were not measured for dropouts. Because there are no controls for intervening variables, except for dropping out of school (DROPOUT2), these coefficients approximate the total effects of the background variables. The results are consistent with past research. The status background variables exercise pervasive effects. Small-to-moderate and highly statistically significant coefficients are associated with the status index (SESNINC1) for every one of the 24 outcomes. The family income variable (LFAMINC1) also exhibits pervasive influence. These effects are particularly strong and positive for educational expectation, occupational expectation, test scores, and parental career expectations of their children (EDASPM2, MAHSCOL2, and FAHSCOL2). Fairly strong positive effects also occur on perceived college ability (COLABL2), career expectations held by school personnel and by friends (TAHSCOL2, GAHSCOL2, FRAHSCL2), whether one's best friend expects to attend college (CFPLCL2), time spent with friends (TIMWFRN2), and the index of the college or school orientation of one's friends (TYPFRN2). Effects of status on attitudinal variables also are pervasive and fairly strong in some cases (e.g., locus of control [LOCUS2]). Significantly positive effects are observed for both status and income on locus of control, self-esteem (CONCPT2), and work values (WORKVAL2). A slight positive effect of status on altruism (IMSEEQ2) is overbalanced by a substantial negative effect of income. Both status and income exhibit small but significant negative effects on community values (COMMUN2). The youth from high status homes interestingly tend to misbehave (SMDEPRT2) more than other youth.

TABLE 3

EFFECTS OF BACKGROUND VARIABLES AND DROPOUT: HSB DATA

Panel 1: Effects of Background and Dropout

	VERBAL2	MATHSD22	SCINSD22	CIVCSD22	EDASP2	OCCASP2
BLACKCMP	-5.120	-4.599	-6.351	-3.151	0.5366	1.693
	-0.2040****	-0.1729****	-0.2412****	-0.1170****	0.0836****	0.0291***
HISPNCMP	-3.747	-3.336	-3.932	-3.047	-0.1692	-0.9381E-01
	-0.1413****	-0.1187****	-0.1414****	-0.1070****	-0.0249**	-0.0015
SEXCMP2	1.169	-1.277	-2.469	1.047	0.1622	7.832
	0.0631****	-0.0650****	-0.1269****	0.0526****	0.0342****	0.1821****
SESNINC1	4.041	4.064	3.371	2.813	1.217	5.648
	0.2562****	0.2444****	0.2084****	0.1675****	0.3039****	0.1611****
LFNINC1N	1.246	1.315	0.9412	0.8867	0.4145	2.041
	0.0718****	0.0715****	0.0617****	0.0476****	0.0934****	0.0807****
DROPOUT2	-5.560	-5.475	-4.822	-4.640	-1.267	-6.481
	-0.1975****	-0.1841****	-0.1639****	-0.1541****	-0.1766****	-0.0996****
ADJ R-SQ	0.2902	0.2503	0.2596	0.1384	0.1887	0.0890
NO./CASES	14265	14265	14265	14265	14265	14265

	CONCPT2	LOCUS22	WORKVAL2	EDASPR2	INSEED2	COMMUN2
BLACKCMP	0.1526	-0.6492E-01	0.6806E-01	0.8585	0.3006	0.7720
	0.0996****	-0.0323****	0.0817****	0.1461****	0.1676****	0.1412****
HISPNCMP	-0.4568E-01	-0.1676	-0.1243E-01	0.2918E-01	0.9807E-01	0.2185
	-0.0282***	-0.0789****	-0.0141	0.0047	0.0517****	0.0378****
SEXCMP2	-0.4146E-01	0.1226	-0.7329E-01	-0.1097E-02	0.4349E-01	-0.3039
	-0.0366****	0.0893****	-0.1191****	-0.0003	0.0328****	-0.0764****
SESNINC1	0.6262E-01	0.1957	0.2804E-01	0.9080	0.2979E-01	-0.8617E-01
	0.0656****	0.1562****	0.0540****	0.2479****	0.0266**	-0.0253**
LFNINC1N	0.6910E-01	0.1215	0.3573E-01	0.3156	-0.5589E-01	-0.7423E-01
	0.0653****	0.0875****	0.0621****	0.0777****	-0.0451****	-0.0196*
DROPOUT2	-0.6375E-02	-0.2305	-0.4323E-01	-0.7895	-0.6030E-02	0.4554E-01
	-0.0037	-0.1026****	-0.0465****	-0.1202****	-0.0030	0.0075
ADJ R-SQ	0.0219	0.0960	0.0360	0.1199	0.0387	0.0519
NO./CASES	14265	14265	14265	14265	14265	14265

Panel 2: Effects of Background

	COLABL2	AVGRAD2	HOMWRK2	SMDEPRT2	MAMSCOL2	FAMSCOL2
BLACKCMP	0.1857	-0.1771	0.4055	0.1847	0.8697E-01	-0.2623E-02
	0.0829****	-0.0982****	0.0378****	0.0149	0.0690****	-0.0020
HISPNCMP	-0.1241	-0.1710	-0.1490	0.3567	-0.1890E-01	-0.5675E-02
	-0.0525****	-0.0898****	-0.0132	0.0272**	-0.0142	-0.0041
SEXCMP2	0.1125	0.2244	1.077	-1.440	0.8388E-01	0.9286E-01
	0.0680****	0.1684****	0.1361****	-0.1569****	0.0901****	0.0950****
SESNINC1	0.2747	0.1574	1.049	-0.3890	0.2165	0.2476
	0.1967****	0.1400****	0.1571****	-0.0502****	0.2755****	0.3002****
LFNINC1N	0.1283	0.5809E-01	0.3784	0.7229E-01	0.6832E-01	0.1196
	0.0829****	0.0466****	0.0511****	0.0084	0.0784****	0.1308****
ADJ R-SQ	0.0753	0.0906	0.0629	0.0354	0.1095	0.1563
NO./CASES	14265	14265	14265	14265	14265	14265

	TAMSCOL2	GAMSCOL2	FRAMSCL2	CFPLCL2	TIMWFRN2	TYPFRN2
BLACKCMP	0.8639E-01	0.7623E-01	0.5772E-01	0.9034E-01	-0.3054	0.4287E-01
	0.0641****	0.0569****	0.0430****	0.0758****	-0.0788****	0.0591****
HISPNCMP	0.2157E-02	-0.1818E-01	-0.4270E-01	-0.2690E-02	-0.9313E-01	-0.1299E-01
	0.0015	-0.0128	-0.0301***	-0.002[illegible]	-0.0227**	-0.0182*
SEXCMP2	0.7404E-01	0.8844E-01	0.1264	0.7[illegible]E-01	-0.9092E-01	0.5831E-01
	0.0744****	0.0863****	0.1273****	0.0799****	-0.0317****	0.1087****
SESNINC1	0.1544	0.1430	0.2024	0.1457	0.1506	0.2339E-01
	0.1837****	0.1710****	0.2416****	0.1962****	0.0623****	0.0517****
LFNINC1N	0.5018E-01	0.4975E-01	0.8067E-01	0.3917E-01	0.1450	0.7111E-02
	0.0539****	0.0537****	0.0867****	0.0476****	0.0541****	0.0142
ADJ R-SQ	0.0531	0.0507	0.1037	0.0584	0.0241	0.0198
NO./CASES	14265	14265	14265	14265	14265	14265

Notes: 1. Dependent variables cross columns; independent variables cross rows.
2. Dependent variables in panel 2 were not measured for dropouts at first follow-up; hence, DROPOUT2 could not be used as a predictor of them.
3. First entry in each pair of rows is the unstandardized coefficient; the second entry is the standardized coefficient.

* p < .05 ** p < .01 *** p < .001 **** p < .0001

Many statistically significant coefficients are associated with race. The patterns here are not predictable from the patterns associated with status and income, however. For example, whereas blacks have lower internal locus of control, lower test scores, and lower grades (as would be predicted from the fact that they are members of a minority), being black has positive effects on self-esteem, educational expectation, and homework. Hispanics, on the other hand, exhibit a pattern that is much easier to anticipate from the fact they are members of a minority group. The effects of gender (SEXCMP2) also are interesting but distinctive. As is well known, females do better on verbal tests and not as well in mathematics and science. Females earn much higher grades and study much harder than males. They also have lower self-esteem and higher internal locus of control.

Because of the current high interest in the high school dropout phenomenon, table 3 also exhibits effect estimates associated with dropping out (DROPOUT2) on the variables that were measured at first follow-up for dropouts. These estimates are net of the influence of the other variables in the table; however, they are not net of sophomore year measures of grades, tests, career, expectations, and attitudes. It will be interesting to compare the coefficients in table 3 associated with DROPOUT2 to those in table 4 where all these sophomore measures are controlled. Without the sophomore controls, dropping out appears to have pervasive influence; nearly every coefficient associated with dropout is statistically significant and with the expected sign. Dropping out appears to have no association with self-esteem, net of the status background variables.

Coefficients in table 4 estimate the effects of lagged values of each of the outcomes on the senior-year measure of each outcome. It should be noted that each equation (column) in table 4 was estimated under control for all the background variables in table 3 and for dummy variables used to represent the effects of the curriculum profile variable, but the coefficients for these variables are not displayed in table 4 (those for the profiles are given in table 5).

The data in table 4 are too extensive to summarize in detail, but there are some important observations contained in the table. First, the lagged values of the dependent variables exercise pervasive influence on the senior-year outcomes. The lagged value of each variable (except civics test) has the strongest effect on the senior-year measure, but many crossed effects also occur. The test scores exercise particularly strong and pervasive effects. Verbal test score, for example, has the second highest effect on educational expectation--second by a very thin margin to mother's educational expectation (EDASPM1)--and exhibits by far the strongest effect on occupational expectation. Verbal test score also exercises a dominant influence on locus of control, perceived ability to complete college, and grades. Math test score has an

TABLE 4

EFFECT ESTIMATES OF LAGGED ENDOGENOUS VARIABLES ON 24 IN-SCHOOL OUTCOMES: HSB DATA

	VERBAL2	MATHSD22	SCIMSD22	CIVCSD22	EDASP2	OCCASP2
DROPOUT2	-2.037	-1.734	-1.981	-1.641	-0.5080	-3.206
	-0.0726****	-0.0583****	-0.0673****	-0.0545****	-0.0708****	-0.0493****
VERBAL1	0.5446	0.1125	0.2100	0.3248	0.2049E-01	0.2210
	0.5022****	0.0979****	0.1846****	0.2790****	0.0739****	0.0279****
MATHSD21	0.5304E-01	0.5040	0.8305E-01	0.4137E-01	0.1454E-01	-0.3997E-02
	0.0506****	0.4540****	0.0756****	0.0368***	0.0543****	-0.0016
SCIMSD21	0.6119E-01	0.6010E-01	0.3353	0.6510E-01	0.3474E-02	-0.4457E-01
	0.0625****	0.0579****	0.3265****	0.0619****	0.0139	-0.0196
CIVCSD21	0.3749E-01	-0.1132E-01	0.7542E-02	0.1361	0.3100E-02	0.3764E-01
	0.0381****	-0.0108	0.0073	0.1287****	0.0123	0.0165
EDASP1	0.8455E-01	0.2503	0.1338	0.1213	0.2587	0.6042
	0.0237**	0.0663****	0.0358****	0.0317**	0.2839****	0.0732****
COLABL1	0.2436	0.2997	0.1730	0.1233	0.1065	0.4163
	0.0275****	0.0319****	0.0186*	0.0130	0.0470****	0.0203*
OCCASP1	0.6923E-02	-0.4758E-02	-0.6527E-02	0.5110E-02	0.3122E-02	0.1813
	0.0152**	-0.0099	-0.0137*	0.0105	0.0268****	0.1720****
CONCPT1	-0.2189	-0.2976	0.8476E-02	-0.2707	0.1848E-01	-0.1461
	-0.0143**	-0.0183***	0.0005	-0.0165*	0.0047	-0.0041
LOCUS21	1.098	0.5094	0.7790	0.9746	0.3595E-01	0.9388
	0.0862****	0.0377****	0.0583****	0.0713****	0.0110	0.0318***
WORKVAL1	0.2386	-0.2415	0.2542	0.3581	0.5685E-01	1.734
	0.0081	-0.0077	0.0082	0.0113	0.0075	0.0253**
COMMUN1	-0.9488	-0.5912	-0.7080	-0.5599	-0.3807E-01	-0.8305
	-0.0447****	-0.0263***	-0.0318***	-0.0246*	-0.0070	-0.0169
SHDEPRT1	-0.2585E-01	-0.1052E-01	-0.9249E-02	-0.2568E-01	0.1049E-01	0.3461E-01
	-0.0103	-0.0040	-0.0035	-0.0096	0.0164*	0.0060
AVGRAD1	0.6828	1.193	0.5238	0.8584	0.1617	0.5037
	0.0597****	0.0983****	0.0436****	0.0699****	0.0552****	0.0190
HOMWRK1	0.6985E-01	0.1298	0.3773E-01	0.9550E-01	0.5922E-01	0.1467
	0.0253****	0.0443****	0.0130*	0.0322****	0.0837****	0.0229**
IMSEEQ1	0.2338	0.4086E-01	0.2346	0.2866	0.5925E-01	0.9348E-01
	0.0171*	0.0028	0.0164	0.0195*	0.0169	0.0029
EDASPM1	0.1084	0.6346E-01	0.6580E-01	0.9946E-01	0.8021E-01	0.1033
	0.0264****	0.0146*	0.0153*	0.0226**	0.0765****	0.0109
MAHSCOL1	0.3748	0.7525E-01	0.1071	0.4323	0.9135E-01	0.4698
	0.0193**	0.0036	0.0052	0.0207*	0.0183*	0.0104
FAHSCOL1	-0.1142	0.6112E-01	-0.1366E-01	-0.2506E-01	0.2175	0.5199
	-0.0061	0.0031	-0.0007	-0.0012	0.0454****	0.0120
TAHSCOL1	-0.1357	-0.5046E-01	-0.6172E-01	-0.1637	0.1839E-01	0.1981
	-0.0067	-0.0024	-0.0029	-0.0076	0.0036	0.0042
GAHSCOL1	0.4835E-01	0.3362	0.1988	-0.1972E-01	0.4089E-02	0.4251
	0.0024	0.0156*	0.0093	-0.0009	0.0008	0.0090
FRAHSCL1	-0.2060	-0.2934E-01	-0.4509	-0.7748E-01	0.1019	1.547
	-0.0109	-0.0015	-0.0227**	-0.0038	0.0210**	0.0352***
CFPLCL1	0.7992E-01	0.9900E-01	-0.6600E-01	-0.3504	0.1884	2.199
	0.0041	0.0048	-0.0032	-0.0166*	0.0375****	0.0483****
ADJ R-SQ	0.6844	0.6320	0.5396	0.3725	0.4563	0.1843
NO./CASES	14265	14265	14265	14265	14265	14265

Table 4 -- con't.

	CONCPT2	LOCUS22	WORKVAL2	EDASPN2	INSEEQ2	COMMUN2
DROPOUT2	0.7795E-01 0.0456****	-0.4747E-01 -0.0211**	-0.2729E-01 -0.0293***	-0.2944 -0.0448****	0.5034E-02 0.0025	-0.9222E-01 -0.0151
VERBAL1	0.1872E-02 0.0283*	0.1440E-01 0.1659****	0.2655E-04 0.0007	0.1568E-01 0.0618****	0.2232E-03 0.0029	-0.2087E-01 -0.0883****
MATHSD21	-0.2460E-04 -0.0004	-0.2483E-02 -0.0296**	-0.6393E-03 -0.0184	0.3312E-02 0.0135	-0.3791E-02 -0.0506****	0.1950E-02 0.0085
SCINSD21	0.3138E-03 0.0053	0.4258E-02 0.0543****	-0.1269E-02 -0.0391**	0.4574E-02 0.0200	-0.1182E-02 -0.0169	-0.8705E-02 -0.0408**
CIVCSD21	0.9862E-03 0.0164	0.2238E-02 0.0284**	0.5563E-03 0.0170	-0.5948E-03 -0.0026	0.9101E-03 0.0129	-0.5589E-02 -0.0260*
EDASP1	0.5252E-02 0.0242*	-0.4593E-03 -0.0016	0.3167E-02 0.0268*	0.1295 0.1553****	0.1591E-01 0.0625****	0.6723E-02 0.0087
COLABL1	0.3504E-01 0.0649****	0.5025E-01 0.0709****	0.3334E-02 0.0113	0.6542E-01 0.0316***	0.1329E-02 0.0021	0.4886E-01 0.0253*
OCCASP1	-0.4065E-03 -0.0147	0.[illegible]324E-03 0.0091	-0.1183E-03 -0.0078	0.2990E-02 0.0281***	0.2048E-04 0.0006	0.4760E-03 0.0048
CONCPT1	0.3702 0.3958****	0.9267E-01 0.0755****	0.1366E-01 0.0268**	-0.3765E-01 -0.0105	0.8030E-02 0.0073	-0.1961E-01 -0.0059
LOCUS21	0.2603E-01 0.0335****	0.3359 0.3294****	-0.6954E-02 -0.0165	0.3478E-01 0.0117	0.1134E-02 0.0012	0.4689E-01 0.0169
WORKVAL1	0.2799E-01 0.0156	-0.1974E-01 -0.0084	0.3252 0.3323****	0.8159E-01 0.0118	-0.5836E-01 -0.0277***	-0.4955E-01 -0.0077
COMMUN1	0.1598E-01 0.0123	0.2573E-01 0.0151	0.1251E-01 0.0178	0.4660E-01 0.0094	0.1371 0.0903****	0.5369 0.1161****
SMDEPRT1	0.8817E-03 0.0058	-0.2723E-02 -0.0136	0.1933E-02 0.0233**	0.1464E-01 0.0250**	0.1474E-02 0.0082	0.1699E-01 0.0311***
AVGRAD1	0.9317E-02 0.0133	0.3388E-02 0.0037	-0.9599E-03 -0.0025	0.6676E-01 0.0249**	-0.5039E-02 -0.0062	0.2288E-01 0.0092
HOMWRK1	0.2180E-02 0.0129	-0.5984E-03 -0.0027	0.1027E-02 0.0112	0.3448E-01 0.0533****	0.5796E-02 0.0293**	-0.4541E-02 -0.0075
INSEEQ1	-0.1203E-01 -0.0144	-0.2293E-01 -0.0210*	-0.1304E-01 -0.0288*	-0.4981E-02 -0.0016	0.1693 0.1733****	-0.1866E-01 -0.0063
EDASPN1	0.2023E-02 0.0081	0.5225E-02 0.0159	0.2865E-02 0.0211*	0.1892 0.1972****	0.1898E-02 0.0065	0.1093E-02 0.0012
MAHSCOL1	-0.2356E-01 -0.0198	0.5053E-02 0.0032	0.1529E-01 0.0237*	0.1794 0.0394****	0.3233E-01 0.0232*	0.3590E-01 0.0085
FAHSCOL1	0.1233E-01 0.0108	-0.2519E-01 -0.0168	0.1627E-02 0.0026	0.2577 0.0589****	-0.2813E-01 -0.0210	-0.8076E-01 -0.0198
TAHSCOL1	0.9818E-02 0.0080	0.3702E-01 0.0229*	-0.1410E-01 -0.0210*	0.8104E-01 0.0171	0.4574E-01 0.0317**	0.4521E-01 0.0103
GAHSCOL1	0.2780E-02 0.0022	-0.1149E-01 -0.0071	0.1202E-01 0.0178	-0.8957E-02 -0.0019	0.3944E-03 0.0003	0.1612E-01 0.0036
FRAHSCL1	0.2574E-01 0.0223*	0.2187E-01 0.0144	0.1371E-02 0.0022	0.5402E-01 0.0122	0.2388E-01 0.0176	0.3302E-01 0.0080
CFPLCL1	-0.3684E-01 -0.0308***	-0.9353E-03 -0.0006	0.3031E-02 0.0047	0.8365E-01 0.0182*	-0.1576E-01 -0.0112	-0.1232E-01 -0.0029
ADJ R-SQ	0.2129	0.3195	0.1546	0.3097	0.1139	0.0759
NO./CASES	14265	14265	14265	14265	14265	14265

Table 4 -- con't.

	COLABL2	AVGRAD2	HOMWRK2	SMDEPRT2	MAHSCOL2	FAHSCOL2
VERBAL1	0.8322E-02	0.4778E-02	-0.6215E-02	0.1099E-01	0.1009E-02	0.4707E-03
	0.0860****	0.0613****	-0.0134	0.0205	0.0185	0.0082
MATHSD21	0.4095E-02	0.7120E-02	0.2170E-01	-0.9826E-02	0.1685E-02	0.2589E-02
	0.0438****	0.0946****	0.0485****	-0.0190	0.0320**	0.0469****
SCIHSD21	0.1893E-02	-0.2537E-03	-0.1498E-02	0.6967E-02	-0.5471E-04	-0.6501E-03
	0.0217	-0.0036	-0.0036	0.0144	-0.0011	-0.0126
CIVCSD21	0.2202E-02	0.1463E-02	0.2269E-02	0.4606E-02	0.1133E-02	0.4816E-03
	0.0251**	0.0207*	0.0054	0.0094	0.0229**	0.0093
EDASP1	0.1177E-01	0.2315E-02	0.1187	-0.2591E-01	0.9261E-02	0.9062E-02
	0.0370***	0.0090	0.0781****	-0.0147	0.0518****	0.0483****
COLABL1	0.1990	0.5314E-02	-0.1949E-01	-0.6142E-01	0.4101E-01	0.3062E-01
	0.2519****	0.0084	-0.0052	-0.0140	0.0922****	0.0656****
OCCASP1	0.7117E-03	0.2305E-03	-0.9364E-04	-0.1083E-02	0.1039E-02	0.7016E-03
	0.0175*	0.0071	-0.0005	-0.0048	0.0455****	0.0293****
CONCPT1	0.4727E-01	0.5780E-02	0.3602E-01	-0.1113	-0.1652E-01	-0.1637E-01
	0.0346****	0.0052	0.0055	-0.0147	-0.0215**	-0.0203**
LOCUS21	0.3293E-01	0.2398E-01	0.4950E-01	0.2205E-01	0.1106E-01	0.9673E-02
	0.0290***	0.0262***	0.0091	0.0035	0.0173*	0.0144
WORKVAL1	0.1663E-01	-0.2559E-01	-0.2977	0.3326	0.3636E-03	-0.2060E-01
	0.0063	-0.0121	-0.0236**	0.0228**	0.0007	-0.0133
COMMUN1	0.3152E-03	0.1184E-01	0.7196E-01	-0.8224E-01	-0.1899E-01	-0.9204E-02
	0.0002	0.0078	0.0079	-0.0078	-0.0178*	-0.0082
SMDEPRT1	0.1027E-01	0.6501E-02	0.4476E-01	0.3823	0.6248E-03	-0.1637E-02
	0.0460****	0.0361****	0.0419****	0.3085****	0.0050	-0.0124
AVGRAD1	0.6651E-01	0.4342	0.3144	-0.3094	0.2568E-01	0.1838E-01
	0.0652****	0.5281****	0.0644****	-0.0546****	0.0447****	0.0305***
HOMWRK1	0.1072E-01	0.6513E-02	0.4867	-0.2676E-01	0.2382E-02	0.1483E-02
	0.0435****	0.0328****	0.4122****	-0.0195*	0.0172*	0.0102
EDASPM1	0.3022E-02	-0.3314E-02	0.2670E-02	0.4332E-01	0.1231E-01	0.4971E-02
	0.0083	-0.0113	0.0015	0.0214*	0.0598****	0.0230**
MAHSCOL1	0.4575E-01	-0.3118E-01	0.1199	0.4685E-02	0.2393	-0.8123E-02
	0.0264*	-0.0223*	0.0144	0.0005	0.2450****	-0.0079
FAHSCOL1	0.6641E-01	-0.5779E-02	-0.1660	0.3143E-01	0.6831E-01	0.3835
	0.0398****	-0.0043	-0.0208*	0.0034	0.0727****	0.3890****
TAHSCOL1	0.1327E-01	0.7095E-01	0.1699	-0.9122E-01	-0.2373E-01	-0.2783E-01
	0.0074	0.0489****	0.0197*	-0.0091	-0.0234**	-0.0261**
GAHSCOL1	0.3105E-01	-0.1631E-01	-0.3119E-01	-0.7899E-01	0.2246E-01	0.1300E-01
	0.0171	-0.0112	-0.0036	-0.0079	0.0220*	0.0121
FRAHSCL1	0.6404E-02	-0.1009E-02	0.1164	0.1860	0.2152E-01	0.1634E-01
	0.0038	-0.0007	0.0144	0.0166	0.0226**	0.0164*
CFPLCL1	0.4903E-01	-0.1351E-01	-0.1488E-01	0.3140E-01	0.6487E-01	0.5489E-01
	0.0280**	-0.0096	-0.0018	0.0032	0.0658****	0.0531****
TIMWFRN1	0.2163E-01	0.1042E-01	0.2640E-01	0.2332	-0.6237E-03	0.1215E-02
	0.0372****	0.0222**	0.0095	0.0722****	-0.0019	0.0035
TYPFRN1	-0.2621E-01	0.1445E-02	0.1988	-0.7297	-0.5013E-02	-0.1472E-01
	-0.0091	0.0006	0.0144	-0.0456****	-0.0031	-0.0086
ADJ R-SQ	0.2722	0.4506	0.2895	0.1766	0.3510	0.3850
NO./CASES	14265	14265	14265	14265	14265	14265

Table 4 -- con't.

	TAHSCOL2	GAHSCOL2	FRANSCL2	CFPLCL2	TINWFRN2	TYPFRN2
VERBAL1	0.1117E-02 0.0192	0.9568E-03 0.0165	0.1425E-02 0.0245	0.1075E-02 0.0209	0.5362E-02 0.0320*	-0.9997E-03 -0.0319*
MATHSD21	0.2728E-02 0.0485****	0.2182E-02 0.0390***	0.3412E-02 0.0609****	0.1494E-02 0.0301*	-0.4268E-02 -0.0264*	-0.7843E-03 -0.0259*
SCINSD21	0.3524E-03 0.0067	-0.2831E-03 -0.0054	-0.1004E-02 -0.0192	-0.6504E-04 -0.0014	-0.4419E-02 -0.0292*	0.5468E-03 0.0193
CIVCSD21	0.9761E-03 0.0185	0.1307E-02 0.0248**	0.4782E-03 0.0091	-0.1587E-03 -0.0034	0.2849E-02 0.0187	-0.3357E-03 -0.0118
EDASP1	0.5071E-02 0.0265*	0.8739E-02 0.0459****	0.1276E-01 0.0669****	0.6727E-02 0.0398***	0.8728E-03 0.0016	0.7326E-03 0.0071
COLABL1	0.2288E-01 0.0481****	0.3069E-01 0.0649****	0.2628E-01 0.0554****	0.2363E-01 0.0562****	-0.8321E-02 -0.0061	0.7745E-02 0.0302**
OCCASP1	0.9792E-03 0.0401****	0.9485E-03 0.0391****	0.9520E-03 0.0391****	0.8013E-03 0.0371****	0.2870E-03 0.0041	-0.4186E-04 -0.0032
CONCPT1	0.8649E-02 0.0105	0.3131E-03 0.0004	-0.1233E-01 -0.0150*	-0.9539E-02 -0.0131	0.3895E-01 0.0164	0.8768E-02 0.0198*
LOCUS21	0.2654E-01 0.0388****	0.2192E-01 0.0322***	0.2448E-01 0.0359****	-0.1085E-02 -0.0018	-0.3466E-02 -0.0018	0.8691E-02 0.0236*
WORKVAL1	-0.1956E-02 -0.0012	0.3065E-02 0.0019	-0.9972E-02 -0.0063	-0.1070E-01 -0.0076	0.3164 0.0694****	-0.3615E-01 -0.0424****
COMMUN1	0.4198E-01 0.0368****	0.4581E-02 0.0040	0.1045E-01 0.0092	0.6770E-02 0.0067	0.8194E-03 0.0002	0.2607E-01 0.0425****
SMDEPRT1	0.1319E-02 0.0098	-0.1238E-02 -0.0093	-0.1547E-03 -0.0012	-0.1537E-02 -0.0129	0.1193E-01 0.0308***	-0.3905E-02 -0.0539****
AVGRAD1	0.6910E-01 0.1124****	0.5357E-01 0.0876****	0.4377E-01 0.0714****	0.1219E-01 0.0224*	-0.8497E-01 -0.0481****	0.2095E-01 0.0633****
HOMWRK1	0.7334E-02 0.0494****	0.6671E-02 0.0452****	0.4233E-02 0.0286***	0.4272E-02 0.0326***	-0.9501E-02 -0.0222*	0.2743E-02 0.0343***
EDASPM1	0.6061E-02 0.0275**	0.4630E-02 0.0212*	0.3462E-02 0.0158	0.6065E-03 0.0031	-0.8919E-02 -0.0141	-0.2103E-03 -0.0018
MAHSCOL1	0.2940E-01 0.0281**	0.3940E-01 0.0379***	0.9300E-01 0.0893****	0.2527E-01 0.0274*	0.6112E-01 0.0203	-0.1764E-01 -0.0313**
FAHSCOL1	0.2993E-01 0.0298**	0.4132E-01 0.0414****	0.3216E-01 0.0321**	0.3050E-01 0.0344**	-0.1003E-01 -0.0035	0.1730E-01 0.0320**
TAHSCOL1	0.1362 0.1256****	0.5690E-01 0.0527****	0.1210E-01 0.0112	0.2775E-01 0.0290**	-0.2483E-01 -0.0080	0.1003E-01 0.0172
GAHSCOL1	0.6510E-01 0.0597****	0.1262 0.1163****	0.1180E-01 0.0109	0.1054E-01 0.0109	0.7643E-02 0.0024	-0.1827E-02 -0.0031
FRAHSCL1	0.9042E-01 0.0888****	0.6651E-01 0.0657****	0.1473 0.1451****	0.1458E-01 0.0162	0.4953E-01 0.0169	0.5421E-02 0.0099
CFPLCL1	0.1248E-01 0.0118	0.4601E-01 0.0439****	0.8629E-01 0.0821****	0.1803 0.1937****	0.1210E-01 0.0040	0.2502E-01 0.0441****
TINWFRN1	0.6284E-02 0.0179	0.4886E-02 0.0140	-0.2582E-02 -0.0074	-0.1177E-01 -0.0380***	0.2757 0.2736****	-0.1102E-02 -0.0058
TYPFRN1	-0.7482E-02 -0.0043	-0.6531E-02 -0.0038	0.8309E-02 0.0048	0.7230E-01 0.0471****	-0.4824E-01 -0.0097	0.1785 0.1910****
ADJ R-SQ	0.2385	0.2233	0.3042	0.1939	0.1353	0.1088
NO./CASES	14265	14265	14265	14265	14265	14265

Notes: 1. Dependent variables cross columns; independent variables cross rows.
2. Dependent variables in panel 2 were not measured for dropouts
3. First entry in each pair of rows is the unstandardized coefficient; the second entry is the standardized coefficient.

* p < .05 ** p < .01 *** p < .001 **** p < .0001

even stronger effect on grades. Math test score also has a pervasive influence on the opinions of others as to whether one should attend college and how much schooling one should complete. The effects of educational expectation also are strong and pervasive. In fact, the estimated effects of educational expectation on the mathematics test score is slightly stronger than the effect of mathematics test score on educational expectation, and this pattern holds under controls for homework and grades. The effects of dropping out remain pervasive, but they are substantially reduced in magnitude as compared to their values in table 3--by over one-half in many instances. It is indeed interesting to see that dropping out net of the controls in table 4, has an estimated positive effect on self-esteem.

Estimates of the effects of vocational curriculum on these outcomes are displayed in table 5. None of these effects is large, but they certainly are consistent. Being a vocational concentrator has a negative effect on all 4 test scores, educational expectation, occupational expectation, perceived college ability, grades, time spent on homework, and every variable measuring the opinions of others regarding how much schooling one should attain, as well as the amount of schooling one expects one's friends will achieve. In each of these instances the coefficients tend to shift gradually from negative to positive as the concentration in vocational curriculum decreases. The magnitude of the effects of the academic dummy variable, however, are not strong. The effects of the curriculum variables on self-esteem (CONCPT2) are negligible. Small negative effects of participation in vocational education are evident on locus of control and "altruism" (IMSEEQ2), and small positive effects are observed on work values (WORKVAL2).

Vocational students also spend more time with peer friends (TIMWFRN2), and their friends tend to be less oriented to doing well in school (TYPFRN2). Each of the unstandardized coefficients associated with one of the profile variables is equivalent to the deviation from the mean of those classified as in the general curriculum. Direct comparisons of the results in table 5 can be made to the original differences by subtracting the mean for the general curriculum from the mean of each of the variables displayed in table 2. This exercise shows that the original differences among the 5 curricula are partially accounted for by controls for background and the lagged dependent variables, but not entirely. Because so many controls are used in the present study, and the number of cases is adequate to handle models of the size reported here, it is difficult to argue that the remaining effects of curriculum are spurious--due to selection into curriculum at the beginning of high school. However, such an interpretation could never be ruled out entirely.

Until the work carried out at the National Center for Research in Vocational Education under the direction of Paul Campbell appeared, most empirical investigation of the effects of vocational education relied on self-report curriculum, and three

TABLE 6

EFFECT ESTIMATES OF CURRICULUM PROFILES ON 24 IN-SCHOOL OUTCOMES: HSB DATA

	VERBAL2	MATHSD22	SCIMSD22	CIVCSD22	EDASP2	OCCASP2
PRCONCD	-0.6725	-1.449	-0.7666	-0.7749	-0.4374	-2.338
	-0.0228****	-0.0464****	-0.0248****	-0.0245***	-0.0580****	-0.0342****
PRLCONCD	-0.3668	-0.5448	-0.3281	-0.3309	-0.2911	-2.176
	-0.0151**	-0.0211****	-0.0129*	-0.0127	-0.0467****	-0.0386****
PRCONEXD	0.2473E-02	-0.2718	-0.6714E-01	-0.2868E-01	-0.9656E-01	-0.6444
	0.0001	-0.0089	-0.0022	-0.0009	-0.0130*	-0.0096
PRACADD	0.9600	2.312	1.190	0.5339	0.4517	2.533
	0.0151**	0.0343****	0.0178**	0.0078	0.0277****	0.0172*
ADJ R-SQ	0.6844	0.6320	0.5396	0.3725	0.4563	0.1843
NO./CASES	14265	14265	14265	14265	14265	14265

	CONCPT2	LOCUS22	WORKVAL2	EDASPM2	IMSEEQ2	COMMUN2
PRCONCD	0.7340E-02	-0.3723E-01	0.1936E-01	-0.2744	-0.7467E-01	-0.3288E-01
	0.0041	-0.0158*	0.0198*	-0.0398****	-0.0354****	-0.0051
PRLCONCD	0.2490E-01	-0.4931E-02	0.3033E-01	-0.2177	-0.3498E-01	-0.1334
	0.0168*	-0.0025	0.0376****	-0.0382****	-0.0201*	-0.0252**
PRCONEXD	0.2214E-01	0.1391E-02	-0.9016E-03	-0.9223E-01	-0.4633E-01	-0.1023
	0.0125	0.0006	-0.0009	-0.0136	-0.0224**	-0.0162
PRACADD	0.2443E-01	0.4411E-01	-0.1846E-01	0.3884	0.3507E-01	0.5402E-01
	0.0063	0.0087	-0.0087	0.0261***	0.0077	0.0039
ADJ R-SQ	0.2129	0.3195	0.1546	0.3097	0.1139	0.0759
NO./CASES	14265	14265	14265	14265	14265	14265

	COLABL2	AVGRAD2	HOMWRK2	SHDEPRT2	MAHSCOL2	FAHSCOL2
PRCONCD	-0.1397	-0.4055E-01	-0.7291	-0.1193	-0.1368	-0.1177
	-0.0531****	-0.0192**	-0.0580****	-0.0082	-0.0924****	-0.0758****
PRLCONCD	-0.8171E-01	-0.9641E-01	-0.6428	-0.1831	-0.7142E-01	-0.7345E-01
	-0.0376****	-0.0551****	-0.0619****	-0.0152	-0.0585****	-0.0573****
PRCONEXD	-0.4743E-01	-0.7669E-01	-0.2998	-0.2147	-0.5373E-01	-0.5584E-01
	-0.0184*	-0.0369****	-0.0243***	-0.0150	-0.0370****	-0.0366****
PRACADD	-0.4730E-02	0.4951E-01	0.8891	-0.1889	-0.6640E-02	-0.3125E-02
	-0.0008	0.0108	0.0327****	-0.0060	-0.0021	-0.0009
ADJ R-SQ	0.2722	0.4506	0.2895	0.1766	0.3510	0.3850
NO./CASES	14265	14265	14265	14265	14265	14265

	TAHSCOL2	GAHSCOL2	FRAHSCL2	CFPLCL2	TIMWFRN2	TYPFRN2
PRCONCD	-0.1056	-0.9990E-01	-0.1548	-0.1299	0.1113	-0.4026E-01
	-0.0667****	-0.0635****	-0.0982****	-0.0929****	0.0245**	-0.0472****
PRLCONCD	-0.7321E-01	-0.9285E-01	-0.1009	-0.7212E-01	0.1305	-0.2078E-01
	-0.0560****	-0.0714****	-0.0775****	-0.0625****	0.0347****	-0.0295***
PRCONEXD	-0.6449E-01	-0.4766E-01	-0.7399E-01	-0.6206E-01	0.5549E-01	-0.1359E-01
	-0.0415****	-0.0308****	-0.0477****	-0.0452****	0.0124	-0.0162*
PRACADD	0.6088E-01	0.2127E-01	0.2372E-01	-0.3784E-02	-0.9716E-01	-0.2020E-03
	0.0178*	0.0063	0.0070	-0.0013	-0.0099	-0.0001
ADJ R-SQ	0.2385	0.2233	0.3042	0.1939	0.1352	0.1088
NO./CASES	14265	14265	14265	14265	14265	14265

Notes: 1. Dependent variables cross columns; independent variables cross rows.
2. First entry in each pair of rows is the unstandardized coefficient; the second entry is the standardized coefficient.

* p < .05 ** p < .01 *** p < .001 **** p < .0001

categories of curriculum were used--academic, vocational, and general. Often these have been collapsed into academic and other. Although Campbell and his colleagues (1981) showed that self-report curriculum and transcript data are not in close agreement, it is nevertheless of interest to examine the effects of self-report curriculum for comparison with past research and because perceptions may carry influence that would not be reflected in formal records of curriculum. The top panel of table 6 (panel 1) reports estimates of the effects of self-report curriculum. Except for the substitution of self-report for the profiles based on transcripts, specifications of the equations in table 6 match the specifications in table 5. Although the effects here generally are not as strong as the effects derived from the transcript data, the pattern is precisely the same. Perceived vocational curriculum tends to deflate performance and career expectations, and perceived academic curriculum has positive effects on their outcomes.

It would be impossible to fully capture in survey data the exposure of students through 4 years of high school to various curricula. Therefore it is useful to experiment with a variety of approaches. In an attempt to gather into one variable some of the most salient aspects of curriculum, the present study defined an index that is intended to differentiate both at the bottom and the top of the curriculum hierarchy. The index is defined by positively weighting the following aspects of curriculum: taken first algebra course, taken second algebra course, taken trigonometry, taken calculus, taken geometry, taken biology, taken chemistry, taken physics, taken honors English, taken honors mathematics, number of foreign language courses taken (standardized to the 0-1 range), and self-report academic curriculum. The following aspects of curriculum were weighted negatively: taken remedial English, taken remedial mathematics, and self-report vocational curriculum. All components of the index were measured by self-report of respondents. Estimates of the effects of the index on each of the 24 outcomes are displayed in the second panel of table 6. The curriculum index exercises pervasive and very strong effects. Curriculum has a strong positive effect on all the test scores, particularly mathematics, on both career expectation variables (EDASP2 and OCCASP2) and perceived college ability, on homework, on grades, and on all of the variables indicating expectations of others regarding the amount of schooling one should attain. A high score on the index also increases the chance that one's friends expect to attend college. Curriculum has a positive effect on internal locus of control (LOCUS2) and on self-esteem (CONCPT2), though the latter effect is small. It also tends to increase association with peers who get good grades and are integrated into school life and decreases the amount of time spent with peer friends. Although the coefficients of the full model used in conjunction with the curriculum index are not tabulated to conserve space, inspection of them reveals that in most instances the curriculum index has the strongest effect of any independent variable except the lagged value of the dependent variable; in

TABLE 6

EFFECT ESTIMATES OF ALTERNATIVE MEASURES OF CURRICULUM ON IN-SCHOOL OUTCOMES: HSB DATA

Panel 1: Effects of Self-Report Curriculum

	VERBAL2	MATHSD22	SCINSD22	CIVCSD22	EDASP2	OCCASP2
VOC1	-0.8224	-0.4661	-0.4473	-0.7504	-0.6329E-01	-0.8178
	-0.0348****	-0.0186***	-0.0180**	-0.0296****	-0.0105	-0.0149
ACADMIC1	0.5338	0.9682	0.3824	0.5013	0.2290	0.4174
	0.0275****	0.0471****	0.0188**	0.0241**	0.0462****	0.0093
ADJ R-SQ	0.6862	0.6321	0.5403	0.3740	0.4540	0.1827
NO./CASES	14265	14265	14265	14265	14265	14265

	CONCPT2	LOCUS22	WORKVAL2	EDASPM2	IMSEEO2	COMMUN2
VOC1	-0.1902E-01	-0.5377E-01	-0.1111E-02	-0.1158	0.3915E-01	0.4761E-01
	-0.0132	-0.0284***	-0.0014	-0.0209**	0.0232**	0.0092
ACADMIC1	0.2426E-01	0.1136E-01	-0.5545E-04	0.9542E-01	0.6004E-02	0.3251E-01
	0.0205*	0.0073	-0.0001	0.0210*	0.0043	0.0077
ADJ R-SQ	0.2140	0.3208	0.1538	0.3079	0.1130	0.0760
NO./CASES	14265	14265	14265	14265	14265	14265

	COLABL2	AVGRAD2	HOMWRK2	SMDEPRT2	MAHSCOL2	FAHSCOL2
VOC1	0.2692E-02	0.1512E-01	0.1070	0.2687	-0.4329E-01	-0.3163E-01
	0.0013	0.0089	0.0106	0.0230**	-0.0365****	-0.0254***
ACADMIC1	0.3649E-01	0.3273E-01	0.3079	-0.8649E-01	0.2341E-01	0.1707E-01
	0.0211*	0.0235**	0.0372****	-0.0090	0.0241**	0.0167*
ADJ R-SQ	0.2689	0.4465	0.2833	0.1770	0.3436	0.3788
NO./CASES	14265	14265	14265	14265	14265	14265

	TAHSCOL2	GAHSCOL2	FRAHSCL2	CFPLCL2	TIMWFRN2	TYPFRN2
VOC1	-0.1951E-01	-0.1796E-01	-0.2244E-01	-0.5558E-01	-0.3121E-01	-0.1677E-01
	-0.0154	-0.0142	-0.0177*	-0.0496****	-0.0086	-0.0245**
ACADMIC1	0.4059E-01	0.5045E-01	0.3341E-01	0.1671E-01	-0.3217E-02	0.6227E-02
	0.0390****	0.0488****	0.0322***	0.0182	-0.0011	0.0111
ADJ R-SQ	0.2333	0.2185	0.2932	0.1870	0.1336	0.1072
NO./CASES	14265	14265	14265	14265	14265	14265

Table 6 -- con't.   Panel 2: Effects of Curriculum Index

	VERBAL2	MATHSD22	SCINSD22	CIVCSD22	EDASP2	OCCASP2
CURINDX1	3.863	7.459	3.343	3.244	1.279	4.672
	0.1038****	0.1891****	0.0856****	0.0812****	0.1343****	0.0541****
ADJ R-SQ	0.6896	0.6478	0.5433	0.3758	0.4613	0.1839
NO./CASES	14265	14265	14265	14265	14265	14265

	CONCPT2	LOCUS22	WORKVAL2	EDASPM2	IMSEEQ2	COMMUN2
CURINDX1	0.6987E-01	0.2041	0.3909E-02	0.7256	0.1461E-02	0.6967E-02
	0.0308**	0.0685****	0.0032	0.0633****	0.0005	0.0009
ADJ R-SQ	0.2140	0.3223	0.1539	0.3105	0.1126	0.0760
NO./CASES	14265	14265	14265	14265	14265	14265

	COLABL2	AVGRAD2	HOMWRK2	SMDEPRT2	MAHSCOL2	FAHSCOL2
CURINDX1	0.4030	0.4053	2.334	-1.102	0.3830	0.3552
	0.1214****	0.1516****	0.1469****	-0.0598****	0.2050****	0.1811****
ADJ R-SQ	0.2763	0.4580	0.2935	0.1783	0.3633	0.3947
NO./CASES	14265	14265	14265	14265	14265	14265

	TAHSCOL2	GAHSCOL2	FRAHSCL2	CFPLCL2	TIMWFRN2	TYPFRN2
CURINDX1	0.3585	0.3765	0.3855	0.3074	-0.3040	0.8252E-01
	0.1794****	0.1894****	0.1935****	0.1741****	-0.0529****	0.0767****
ADJ R-SQ	0.2484	0.2349	0.3112	0.1998	0.1351	0.1096
NO./CASES	14265	14265	14265	14265	14265	14265

Panel 3: Effects of Curriculum Index
and Significant Other Index

	VERBAL2	MATHSD22	SCINSD22	CIVCSD22	EDASP2	OCCASP2
EDASPSO1	-0.3225	-0.1443	-0.6009	-0.2705	0.6253	4.778
	-0.0101	-0.0043	-0.0180*	-0.0079	0.0769****	0.0648****
CURINDX1	3.795	7.167	3.183	3.123	1.194	4.150
	0.1020****	0.1817****	0.0816****	0.0782****	0.1254****	0.0481****
ADJ R-SQ	0.6893	0.6489	0.5433	0.3754	0.4602	0.1845
NO./CASES	14265	14265	14265	14265	14265	14265

	CONCPT2	LOCUS22	WORKVAL2	IMSEEQ2	COMMUN2
EDASPSO1	-0.5450E-02	-0.1799E-02	0.2329E-01	0.7132E-01	0.1281E-01
	-0.0028	-0.0007	0.0221*	0.0314**	0.0018
CURINDX1	0.7172E-01	0.1975	0.1184E-01	-0.2290E-01	-0.1984E-01
	0.0316**	0.0663****	0.0096	-0.0086	-0.0024
ADJ R-SQ	0.2132	0.3216	0.1547	0.1130	0.0763
NO./CASES	14265	14265	14265	14265	14265

	COLABL2	AVGRAD2	HOMWRK2	SMDEPRT2
EDASPSO1	0.1707	-0.3982E-01	0.1719E-01	0.2889
	0.0602****	-0.0174*	0.0013	0.0184
CURINDX1	0.3757	0.3888	2.077	-1.200
	0.1132****	0.1454****	0.1307****	-0.0652****
ADJ R-SQ	0.2770	0.4583	0.2973	0.1784
NO./CASES	14265	14265	14265	14265

Table 6 -- con't., Panel 4: Effects of Profiles & Curriculum Index

	VERBAL2	MATHSD22	SCINSD22	CIVCSD22	EDASP2	OCCASP2
PRCONCD	-0.2958	-0.7393	-0.4461	-0.4611	-0.3232	-1.949
	-0.0100	-0.0237****	-0.0144*	-0.0146*	-0.0429****	-0.0285***
PRLCONCD	-0.2455	-0.3214	-0.2206	-0.2268	-0.2550	-2.049
	-0.0101*	-0.0125*	-0.0086	-0.0087	-0.0410****	-0.0363****
PRCONEXD	0.1442	-0.6708E-02	0.5729E-01	0.9187E-01	-0.5331E-01	-0.4928
	0.0050	-0.0002	0.0019	0.0030	-0.0072	-0.0073
CURINDX1	3.755	7.178	3.182	3.112	1.170	3.989
	0.1009****	0.1819****	0.0815****	0.0779****	0.1229****	0.0462****
ADJ R-SQ	0.6898	0.6490	0.5436	0.3759	0.4642	0.1854
NO./CASES	14265	14265	14265	14265	14265	14265

	CONCPT2	LOCUS22	WORKVAL2	EDASPM2	IMSZEQ2	COMMUN2
PRCONCD	0.1344E-01	-0.1867E-01	0.1995E-01	-0.2101	-0.7721E-01	-0.3804E-01
	0.0075	-0.0079	0.0204*	-0.0305****	-0.0367****	-0.0059
PRLCONCD	0.2587E-01	0.8788E-03	0.3010E-01	-0.1986	-0.3610E-01	-0.1354
	0.0174*	0.0005	0.0373****	-0.0349****	-0.0208*	-0.0255**
PRCONEXD	0.2386E-01	0.8642E-02	-0.9487E-03	-0.6940E-01	-0.4752E-01	-0.1035
	0.0135	0.0037	-0.0010	-0.0102	-0.0230**	-0.0164
CURINDX1	0.7411E-01	0.1986	0.1064E-01	0.6463	-0.2315E-01	-0.1423E-01
	0.0326**	0.0667****	0.0086	0.0742****	-0.0087	-0.0018
ADJ R-SQ	0.2141	0.3222	0.1552	0.3124	0.1139	0.0765
NO./CASES	14265	14265	14265	14265	14265	14265

	COLABL2	AVGRAD2	HOMWRK2	SMDEPRT2	MAHSCOL2	FAHSCOL2
PRCONCD	-0.9889E-01	0.3075E-02	-0.4972	-0.2538	-0.9804E-01	-0.8167E-01
	-0.0376****	0.0015	-0.0395****	-0.0174*	-0.0663****	-0.0526****
PRLCONCD	-0.6669E-01	-0.8034E-01	-0.5569	-0.2341	-0.5697E-01	-0.6003E-01
	-0.0307****	-0.0459****	-0.0536****	-0.0194*	-0.0466****	-0.0468****
PRCONEXD	-0.3204E-01	-0.6022E-01	-0.2113	-0.2686	-0.3869E-01	-0.4193E-01
	-0.0124	-0.0289****	-0.0171*	-0.0187*	-0.0266****	-0.0275****
CURINDX1	0.3679	0.3935	2.090	-1.208	0.3486	0.3248
	0.1108****	0.1472****	0.1316****	-0.0656****	0.1866****	0.1656****
ADJ R-SQ	0.2778	0.4604	0.2976	0.1787	0.3680	0.3982
NO./CASES	14265	14265	14265	14265	14265	14265

	TAHSCOL2	GAHSCOL2	FRAHSCL2	CFPLCL2	TIMWFRN2	TYPFRN2
PRCONCD	-0.6914E-01	-0.6101E-01	-0.1171	-0.9977E-01	0.8236E-01	-0.3236E-01
	-0.0437****	-0.0388****	-0.0742****	-0.0713****	0.0181*	-0.0380****
PRLCONCD	-0.5959E-01	-0.7826E-01	-0.8682E-01	-0.6077E-01	0.1201	-0.1785E-01
	-0.0456****	-0.0602****	-0.0666****	-0.0526****	0.0320****	-0.0254**
PRCONEXD	-0.5032E-01	-0.3240E-01	-0.5929E-01	-0.5014E-01	0.4512E-01	-0.1056E-01
	-0.0324****	-0.0210**	-0.0382****	-0.0365****	0.0101	-0.0126
CURINDX1	0.3280	0.3498	0.2402	0.2711	-0.2625	0.7119E-01
	0.1642****	0.1760****	0.1708****	0.1835****	-0.0457****	0.0661****
ADJ R-SQ	0.2517	0.2385	0.3185	0.2055	0.1360	0.1108
NO./CASES	14265	14265	14265	14265	14265	14265

Notes: 1. First coefficient in each pair of rows is unstandardized; the second coefficient is standardized.
2. Dependent variables cross columns; independent variables cross rows.
3. First entry in each pair of rows is the unstandardized coefficient; the second entry is the standardized coefficient.

* p < .05 ** p < .01 *** p < .001 **** p < .0001

most instances the effect of curriculum is strongest by a wide margin.[7]

A voluminous body of research in the status attainment tradition has emphasized the importance of the effects of significant others such as parents, peers, and school personnel on the formation of career plans of teenage youth (see Campbell [1983] for a review). The evidence supporting this view is pervasive and impressive (e.g., Hauser, Tsai, and Sewell 1983; Jencks, Crouse, and Mueser 1983). The evidence presented here raises fundamental questions about the primary conclusion of that research. The basic idea in the status attainment work is that status background characteristics get translated into career outcomes by the mechanism of parents and other significant others influencing the career goals of youth. Here, however, we have seen that what happens in school has a much stronger effect on educational expectation and occupational expectation than any of the significant other variables. Furthermore, what happens in school, as indicated by the curriculum index, has a much stronger effect on the career expectations held by significant others for youth than does the status index or income. Of course, it is possible that if all the significant other variables (EDASPM1, MAHSCOL1, FAHSCOL1, TAHSCOL1, GAHSCOL1, FRAHSCL1, and CFPLCL1) were aggregated into a single index of significant others' expectations and behaviors, the effects of significant others would be as large as those of curriculum. When the calculations are repeated with an index of significant other variables substituted in place of the components of the index it is found that the significant other index has almost no effect on the test scores and moderate effects on educational and occupational expectations. The curriculum index has twice the effect of the significant other index on educational expectation and about the same size effect on occupational expectation (though just slightly smaller). The dominating effects of curriculum on homework, grades, perceived college ability, and locus of control are preserved in the new specification. The coefficients for both the significant other index and the curriculum index are displayed in panel 3 of table 6. Panel 4 of table 6 shows effect estimates of curriculum when the vocational profiles and the curriculum index are entered simultaneously as right-side variables. The simultaneous inclusion of both types of curriculum variables does not change the substantive interpretations very much over those already inferred. Effect estimates of the curriculum index are changed to only a trivial extent (compare panel 4 to panel 2). The effects of the profiles are changed somewhat, but not enough to change qualitative conclusions very much (compare panel 4 of table 6 to table 5). The effects of being a vocational concentrator on test scores and career expectations are smaller (in absolute magnitude) in table 6 (panel 4) than in table 5, but they were not large in table 5. Similar observations apply to all the significant other variables and to the two friends variables (TIMWFRN2, TYPFRN2). It is interesting that the magnitude of the effect of being a vocational concentrator on grades and homework increases when the curriculum index is added to the specification in table 5.

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[7] The effects of gender on science test score and occupational expectation are somewhat stronger than the curriculum effects.

Post-High School Outcomes for the HSB Sample

Results for post-high school outcomes using the HSB sample are reported in three subsections. The first summarizes findings for educational outcomes. The second reports results for family outcomes. The third reports findings for voting behavior.

Post-High School Education and Training

Four post-high school outcomes are included in the analyses. These are whether the respondent was attending a 4-year college or university at the time of the second follow-up (CUNI4YR3), whether the respondent was attending a junior college at the time of the second follow-up (JRCOL3), whether the respondent was attending a vocational or technical institute at the time of the second follow-up (CVOCSCH3), and the amount of time in years that the respondent had been enrolled in a post-secondary institution since high school (COLTIM3). Table 7 reports estimates of effects of curriculum and selected other variables. The full specification of each equation (column in table 7) closely matches the specifications used for the in-school outcomes. Table 7 reports results from models in which both the curriculum profile variables (based on high school transcripts) and the curriculum index (based on respondent report) are entered as independent variables.

One of the chief findings summarized in table 7 is that none of these variables has much of an effect on attendance at a junior college or a vocational-technical institute. The R-square for both of these equations is near 0. On the other hand, moderately good prediction of current enrollment in a university or 4-year college and of the amount of time enrolled in college is observed. The curriculum index, as with the in-school outcomes, exercises a dominant influence, but being a vocational concentrator or limited concentrator still has a small negative impact on college attendance. A fascinating result reported in table 7 is that the curriculum index has as strong or stronger effect on college attendance than does lagged educational expectation. It also has a stronger effect than any other variable except for the effect of dropping out of school on time spent in college; even the four test scores do not have as large an effect. It must be emphasized, however, that these effects are total effects, not direct effects. If first follow-up (senior year) measures of educational expectation and the test scores had been used, the results probably would show larger effects of these variables and smaller effects of curriculum. The current specification is preferable for present purposes because we first want to identify total effects. It certainly will be of interest in future research to identify the intervening routes by which these total effects operate.

TABLE 7

EFFECT ESTIMATES OF CURRICULUM AND SELECTED OTHER VARIABLES ON POSTSECONDARY EDUCATION OUTCOMES: HSB DATA

	CUNI4YR3	CJRCOL3	CVOCSCH3	COLTIM3
BLACKCMP	0.4340E-01	-0.4292E-02	-0.2029E-02	0.6609E-01
	0.0303***	-0.0042	-0.0034	0.0321***
HISPNCMP	-0.6491E-02	0.2880E-01	0.2222E-02	0.3109E-01
	-0.0058	0.0357**	0.0048	0.0192*
SEXCMP	-0.1860E-01	0.2368E-01	0.5306E-02	0.3493E-01
	-0.0170	0.0362***	0.0141	0.0266**
SESNINC1	0.8826E-01	0.2604E-01	0.6789E-03	0.1539
	0.1182****	0.0488****	0.0022	0.1436****
LFNINC1N	0.1590E-01	-0.9528E-02	0.2650E-02	0.1153E-01
	0.0185	-0.0155	0.0075	0.0094
VERBAL1	0.3473E-02	-0.3384E-03	-0.8492E-03	0.1752E-02
	0.0643****	-0.0088	-0.0381*	0.0226
MATHSD21	0.3628E-02	-0.6442E-03	-0.1349E-03	0.3066E-02
	0.0705****	-0.0175	-0.0064	0.0416***
SCINSD21	-0.1746E-02	0.1447E-02	0.2520E-03	-0.1257E-03
	-0.0357**	0.0414**	0.0125	-0.0018
CIVCSD21	0.9586E-03	-0.7469E-03	0.4178E-03	0.1647E-02
	0.0196	-0.0214	0.0207	0.0235*
DROPOUT2	-0.1045	-0.8448E-01	-0.2809E-01	-0.3802
	-0.0741****	-0.0838****	-0.0483****	-0.1857****
EDASP1	0.2549E-01	0.4618E-02	-0.7026E-03	0.4419E-01
	0.1486****	0.0377**	-0.0099	0.1796****
OCCASP1	0.8004E-03	-0.1799E-03	-0.4650E-03	0.1180E-03
	0.0360****	-0.0113	-0.0507****	0.0037
COLABL1	-0.7940E-02	0.1409E-01	0.1224E-02	0.2595E-01
	-0.0177	0.0439***	0.0066	0.0402****
AVGRAD1	0.6760E-01	-0.1205E-01	-0.1118E-01	0.8028E-01
	0.1177****	-0.0294*	-0.0472***	0.0975****
HOMWRK1	0.7128E-02	-0.8261E-04	0.1053E-02	0.7374E-02
	0.0530****	-0.0009	0.0190	0.0383****
CONCPT1	-0.8733E-02	-0.2423E-02	0.8997E-03	-0.9622E-02
	-0.0118	-0.0045	0.0029	-0.0088
PRCONCD	-0.7814E-01	0.1404E-01	0.6128E-02	-0.7712E-01
	-0.0508****	0.0128	0.0097	-0.0351****
PRLCONCD	-0.4442E-01	0.1873E-01	0.6332E-02	-0.3071E-01
	-0.0362****	0.0214*	0.0125	-0.0175*
PRCONEXD	-0.3062E-01	0.8480E-02	0.7815E-02	-0.2307E-02
	-0.0206*	0.0080	0.0127	-0.0011
PRACADD	0.7384E-01	-0.6192E-01	-0.6571E-02	-0.2863E-01
	0.0240**	-0.0282**	-0.0052	-0.0065
CURINDX1	0.3432	-0.4311E-02	-0.1754E-02	0.4756
	0.1854****	-0.0033	-0.0023	0.1790****
ADJ R-SQ	0.3527	0.0398	0.0086	0.4140
NO./CASES	9938	9938	9938	9819

Notes: 1. Dependent variables cross columns; independent variables cross rows.

2. First entry in each pair of rows is the unstandardized coefficient; the second entry is the standardized coefficient.

* p < .05 ** p < .01 *** p < .001 **** p < .0001

Family Outcomes

Four outcomes related to family are examined in this section. These variables are (1) married since high school (MARAHS3), (2) separated from a marriage since high school (SEPAHS3), (3) became a parent since high school (PARAHS3), and (4) number of children born since high school (NCHAHS3). Because of the likelihood of gender differences regarding these variables, all analyses were carried out separately for males and females. In addition, it is impossible to be separated from a marriage if one were never married, and the probability of having children is higher among married people than among single people. Moreover, the consequences of parenthood depend on whether one is married, especially for females. Therefore, analyses of separation, parenthood, and number of children are reported separately by sex and by whether the respondents were ever married. Respondents in the HSB sample were asked a sequence of questions regarding marriage and family in the base-year survey. Several of these variables were added as predictors of the post-high school marriage and family outcomes. The added variables are (1) an index of family values (FAMILY1) that is intended to indicate the importance a respondent places on a strong or stable family, (2) whether the respondent expected to get married (MAREX1), (3) whether the respondent expected to have children (CHILDEX1), (4) age when the respondent expected to become a parent for the first time (CHILAGE1), (5) whether the respondent was married at the time of the first survey (MARRIED1), and (6) whether the respondent was a parent at the time of the first survey (PARENT1). None of these variables were included in the preceding analyses. However, all lagged variables included in the previous analyses are retained here.

Table 8 displays effect estimates for most of the variables used in the models (region and missing data dummies excepted). Few significant coefficients are associated with the curriculum variables. There may be some tendency, however, for females oriented toward an academic curriculum to have fewer children.

As might be anticipated, dropping out of high school has a strong association with marriage and family outcomes. The term association rather than effect (effect estimate) is used advisably here. Even though the family outcomes were defined to refer to the period following high school (number of children born since high school, for example), the chance for confounding cause and effect in this situation is high.

Even with all these controls for intervening variables, parental status (SESNINC1) exhibits many significantly negative effects. Small samples occur for the ever married groups, and it is for these cases that coefficients are not significant. Blacks are less likely to be married, but they are shown to have more children than non-blacks; again, these effects are significant

TABLE 8

EFFECT ESTIMATES OF CURRICULUM AND SELECTED OTHER VARIABLES ON FAMILY OUTCOMES: HSB DATA

	Marriage after High School		Separation from a Marriage after HS		Parent since HS Males	
	Males	Females	Males	Females	Nev Mar	Married
	MARAHS3	MARAHS3	SEPAHS3	SEPAHS3	PARAHS3	PARAHS3
BLACKCMP	-0.4844E-01	-0.9884E-01	-0.2859E-02	-0.7485E-01	0.6407E-01	0.1234
	-0.0589***	-0.0859****	-0.0023	-0.0672	0.1420****	0.0549
HISPNCMP	0.1657E-01	-0.3659E-01	-0.2385E-01	0.6932E-02	-0.8507E-03	0.4903E-01
	0.0265	-0.0396**	-0.0416	0.0114	-0.0024	0.0465
SESNINC1	-0.2852E-01	-0.3709E-01	0.4965E-01	-0.4230E-02	-0.9760E-02	-0.6319E-02
	-0.0683***	-0.0608***	0.1003	-0.0091	-0.0417*	-0.0069
LFMINC1M	0.4030E-02	-0.9653E-02	-0.4790E-01	0.1728E-01	-0.1553E-02	0.5791E-01
	0.0086	-0.0134	-0.0955	0.0351	-0.0059	0.0627
DROPOUT2	0.1055	0.2713	0.9494E-01	0.1525E-01	0.2282E-01	0.5319E-01
	0.1364****	0.2515****	0.1694*	0.0290	0.0494**	0.0515
VERBAL1	-0.1100E-02	-0.6124E-03	-0.2811E-02	0.2915E-03	-0.6471E-03	0.3257E-02
	-0.0368	-0.0137	-0.0821	0.0089	-0.0386	0.0516
MATHSD21	0.4849E-04	-0.9393E-03	0.1610E-02	-0.1179E-02	0.6628E-03	0.1992E-02
	0.0018	-0.0216	0.0490	-0.0347	0.0432	0.0329
SCINSD21	-0.1642E-03	0.2706E-03	0.1125E-02	0.2810E-02	-0.5329E-03	-0.6447E-02
	-0.0060	0.0066	0.0399	0.0958	-0.0345	-0.1241
CIVCSD21	0.5984E-03	-0.3477E-03	-0.1416E-02	-0.2046E-02	0.8173E-04	0.1440E-03
	0.0224	-0.0085	-0.0513	-0.0696	0.0054	0.0028
EDASP1	-0.3785E-02	-0.6713E-02	0.1502E-02	-0.2291E-02	-0.1147E-02	-0.2098E-01
	-0.0400	-0.0479**	0.0126	-0.0224	-0.0216	-0.0957
OCCASP1	-0.2187E-03	-0.4296E-03	-0.5082E-03	-0.1935E-03	-0.6419E-04	0.2262E-03
	-0.0192	-0.0206	-0.0386	-0.0140	-0.0101	0.0093
COLABL1	-0.1275E-01	0.1536E-02	0.4691E-01	0.4702E-02	0.2988E-02	-0.2443E-01
	-0.0523**	0.0040	0.2034*	0.0204	0.0215	-0.0575
AVGRAD1	0.1004E-01	0.4901E-02	-0.2301E-01	0.3958E-02	-0.3356E-02	0.4260E-01
	0.0316	0.0102	-0.0711	0.0128	-0.0188	0.0715
HOMWRK1	-0.1516E-02	0.1777E-03	-0.3192E-02	-0.3703E-02	-0.8923E-03	-0.1546E-01
	-0.0198	0.0016	-0.0327	-0.0459	-0.0210	-0.0858
CONCPT1	-0.1077E-02	-0.4957E-02	0.4147E-01	0.1646E-01	0.3963E-02	0.5475E-01
	-0.0025	-0.0082	0.0900	0.0413	0.0162	0.0645
FAMILY1	-0.1065E-03	-0.6235E-02	-0.2979E-01	-0.2377E-01	0.9281E-03	-0.1199E-01
	-0.0002	-0.0060	-0.0409	-0.0314	0.0024	-0.0089
MAREX1	0.3082E-01	0.1361E-01	-0.1119	0.7320E-01	0.2802E-01	0.1091
	0.0357	0.0089	-0.1224	0.0629	0.0583*	0.0647
CHLAGE1	-0.3773E-02	-0.1092E-01	0.4888E-02	-0.1194E-02	-0.7019E-03	0.1067E-01
	-0.0442**	-0.0799****	0.0563	-0.0135	-0.0146	0.0667
CHILDEX1	-0.1199E-01	0.3420E-01	0.6359E-01	-0.4682E-01	-0.1241E-01	-0.8560E-02
	-0.0151	0.0272	0.0776	-0.0494	-0.0279	-0.0057
MARRIED1	-0.4513E-01	0.1079	-0.1418	-0.1449	-0.1021	-0.9569
	-0.0067	0.0149	-0.0307	-0.0555	-0.0258	-0.1126
PARENT1	0.8617E-01	-0.6662E-01	0.2073	0.5990E-01	0.9478E-01	0.3176
	0.0234	-0.0154	0.0894	0.0256	0.0427*	0.0743
PRCONCD	0.3850E-02	0.2162E-01	-0.2579E-01	-0.5653E-01	0.3980E-02	-0.1075
	0.0042	0.0183	-0.0294	-0.0722	0.0078	-0.0666
PRLCONCD	-0.2666E-02	-0.4477E-02	-0.1449E-01	-0.9071E-02	-0.6270E-02	0.1663
	-0.0039	-0.0045	-0.0195	-0.0120	-0.0166	0.1217
PRCONEXD	-0.2887E-02	0.2787E-01	-0.6449E-01	-0.4169E-01	-0.5118E-02	0.3637E-01
	-0.0034	0.0235	-0.0726	-0.0563	-0.0108	0.0222
PRACADD	-0.1597E-01	0.9174E-02	1.836	-0.5660E-01	-0.6554E-02	1.993
	-0.0099	0.0035	0.0274	-0.0154	-0.0076	0.0161
CURINDX1	-0.9141E-02	-0.4574E-01	-0.8734E-01	0.3283E-01	-0.2608E-02	0.1664
	-0.0092	-0.0293	-0.0815	0.0302	-0.0047	0.0843
ADJ R-SQ	0.0740	0.1608	0.0107	0.0004	0.0371	0.0510
NO./CASES	4191	4999	294	852	3897	294

Table 8 -- con't.

	Parent since HS		Number of Children since High School			
	Females		Males		Females	
	Nev Mar	Married	Nev Mar	Married	Nev Mar	Married
	PARAHS3	PARAHS3	NCHAHS3	NCHAHS3	NCHAHS3	NCHAHS3
BLACKCMP	0.8723E-01	0.1722	0.6658E-01	0.3009	0.9962E-01	0.2769
	0.1405****	0.0788*	0.1229****	0.0948	0.1337****	0.0941*
HISPNCMP	0.1464E-01	-0.9151E-02	-0.3604E-02	0.1312	0.1498E-01	-0.5236E-01
	0.0278	-0.0077	-0.0085	0.0881	0.0237	-0.0327
SESNINC1	-0.1449E-01	0.7744E-02	-0.1296E-01	0.9223E-01	-0.1569E-01	-0.2303E-01
	-0.0422*	0.0085	-0.0461*	0.0717	-0.0381*	-0.0188
LFMINC1M	-0.8724E-02	0.4534E-02	-0.1032E-02	0.2252E-01	-0.1359E-01	-0.1088E-01
	-0.0214	0.0047	-0.0033	0.0173	-0.0278	-0.0084
DROPOUT2	0.1588	0.1802	0.2051E-01	0.8826E-01	0.1941	0.2426
	0.1840****	0.1746****	0.0370*	0.0606	0.1873****	0.1744****
VERBAL1	-0.9805E-03	-0.6744E-03	-0.9887E-03	0.4533E-02	-0.1275E-02	-0.3680E-02
	-0.0390	-0.0105	-0.0491	0.0509	-0.0422	-0.0426
MATHSD21	0.7312E-03	-0.7948E-03	0.7157E-03	-0.4194E-02	0.8510E-03	-0.3400E-02
	0.0301	-0.0119	0.0389	-0.0491	0.0292	-0.0379
SCINSD21	0.2904E-03	-0.1561E-02	-0.4820E-03	-0.1413E-02	0.3514E-03	0.8233E-03
	0.0125	-0.0272	-0.0260	-0.0193	0.0126	0.0106
CIVCSD21	-0.2783E-03	-0.2342E-02	0.2133E-05	0.2374E-02	-0.4217E-04	-0.2582E-02
	-0.0121	-0.0406	0.0001	0.0331	-0.0015	-0.0333
EDASP1	0.9500E-03	0.5124E-03	-0.2033E-02	-0.2693E-01	0.2483E-02	-0.1645E-02
	0.0118	0.0026	-0.0319	-0.0870	0.0257	-0.0061
OCCASP1	-0.8337E-04	0.7142E-03	-0.6006E-04	-0.7842E-03	-0.3731E-04	0.1583E-02
	-0.0070	0.0264	-0.0079	-0.0229	-0.0026	0.0434
COLABL1	-0.4698E-02	0.2341E-02	0.6427E-02	-0.8160E-01	-0.6215E-02	0.2134E-01
	-0.0208	0.0052	0.0385	-0.1361	-0.0229	0.0350
AVGRAD1	-0.6208E-02	-0.6535E-02	-0.5557E-02	0.7606E-01	-0.1163E-02	-0.7405E-02
	-0.0224	-0.0108	-0.0259	0.0905	-0.0035	-0.0091
HOMWRK1	-0.6849E-03	-0.1191E-01	-0.1003E-02	-0.2759E-01	-0.4157E-03	-0.1271E-01
	-0.0112	-0.0753*	-0.0197	-0.1086	-0.0057	-0.0596
CONCPT1	0.4803E-02	0.1514E-02	0.5152E-02	0.6896E-01	0.5166E-02	-0.1396E-01
	0.0140	0.0019	0.0175	0.0576	0.0126	-0.0133
FAMILY1	-0.2410E-02	0.1655E-01	-0.2217E-02	0.7998E-01	-0.4023E-02	0.6183E-02
	-0.0041	0.0112	-0.0048	0.0422	-0.0057	0.0031
MAREX1	-0.1869E-01	0.2952E-01	0.3300E-01	0.1667	-0.1896E-01	-0.1027
	-0.0221	0.0129	0.0572*	0.0701	-0.0187	-0.0334
CHLAGE1	-0.3737E-02	-0.1347E-01	-0.4160E-03	0.7391E-02	-0.4835E-02	-0.2555E-01
	-0.0466**	-0.0776*	-0.0072	0.0328	-0.0502**	-0.1092**
CHILDEX	0.2477E-01	0.1343E-01	-0.1123E-01	-0.6575E-01	0.3078E-01	0.9108E-01
	0.0355	0.0072	-0.0210	-0.0309	0.0367	0.0364
MARRIED	-0.2157	-0.2449	-0.1493	-1.089	-0.2909	-0.3616
	-0.0359*	-0.0478	-0.0314	-0.0908	-0.0403**	-0.0524
PARENT1	0.2968	-0.1209	0.1579	0.5822	0.5720	0.3309
	0.1145****	-0.0264	0.0593***	0.0966	0.1838****	0.0536
PRCONCD	-0.4811E-02	-0.9566E-01	0.8180E-03	-0.1189	-0.3748E-02	-0.5499E-01
	-0.0072	-0.0624	0.0013	-0.0522	-0.0047	-0.0266
PRLCONCD	-0.2517E-02	-0.2218E-01	-0.1159E-01	0.9990E-01	0.5864E-03	-0.5217E-03
	-0.0046	-0.0150	-0.0258	0.0518	0.0009	-0.0003
PRCONEXD	-0.6098E-02	-0.1865E-01	-0.1041E-01	0.6386E-01	-0.4267E-02	0.4107E-01
	-0.0089	-0.0128	-0.0182	0.0276	-0.0052	0.0210
PRACADD	0.1129E-01	0.2270	-0.9549E-02	-3.277	0.1268E-01	0.2478
	0.0082	0.0315	-0.0092	-0.0188	0.0076	0.0255
CURINDX1	-0.4366E-01	-0.5532E-01	0.4640E-02	0.2254	-0.6353E-01	-0.4535E-01
	-0.0491*	-0.0260	0.0069	0.0809	-0.0596**	-0.0158
ADJ R-SQ	0.1182	0.0644	0.0358	0.0453	0.1369	0.0772
NO./CASES	4147	852	3857	294	4147	852

Notes: 1. Dependent variables cross columns; independent variables cross rows.
2. First entry in each pair of rows is the unstandardized coefficient; the second entry is the standardized coefficient.

* p < .05 ** p < .01 *** p < .001 **** p < .0001

where the sample size is large. Although the sign of the coefficient associated with black for being separated from a marriage is negative for both sexes, it is not significant in either case. In the case of males, it is very close to 0. Unlike the case for education, plans and attitudes regarding family expressed in high school do not exercise strong effects on marital and family behavior in the first 2 years after high school. The age at which one expected to first become a parent (CHLAGE1) expressed when a sophomore in high school does, however, have a statistically significant negative effect on whether one has had any children since high school and on the number of children for females, irrespective of whether they were ever married, but similar effect estimates are not observed for males. The effects for females are not large. Interestingly, age when one expects to first become a parent has a negative effect on marriage for both genders, but marriage expectation (MAREX1) does not. In addition, having been a parent in high school (PARENT1) has a significantly positive effect on parenthood and number of children since high school.

Voting Behavior

Two variables describing voting behavior are available from the second follow-up survey of HSB sophomores; these are registered to vote since reaching 18, and having voted since 18. Effect estimates are presented in table 9. Effects of the curriculum variables are negligible, but other variables related to career attainments do exhibit significant effects. Dropping out of high school has a marked negative impact on the propensity to register to vote and to vote. Educational expectation, perceived college ability, and verbal test score all have small but statistically significant positive effects on registering to vote and voting. Parental status also has moderately strong positive effects on both outcomes. It is interesting to note that blacks, ceteris paribus, are more likely to register to vote and to vote than nonblacks. None of these effects is strong, however, and both R-squares are small.

Results from the NLS Sample

In many ways the analyses with the NLS Youth is different from the analyses with the HSB. First, the NLS sample contains 8 cohorts. As noted in chapter 3, presence of 8 cohorts in the sample means that a simple dynamic model that applies precisely the same for each cohort nevertheless implies that nonlinear estimation should be carried out involving the age variable, or that separate analyses be conducted for each age group. In the present exploratory analyses, however, age is simply entered as a linear control in all the analyses.

A second way in which the NLS sample differs from the HSB is that the older cohorts of the NLS have been out of high school

TABLE 9

EFFECT ESTIMATES OF CURRICULUM AND SELECTED OTHER VARIABLES ON VOTING BEHAVIOR: HSB DATA

	REGVOTE3	VOTED3
BLACKCMP	0.1326	0.8455E-01
	0.0850****	0.0561****
HISPNCMP	0.2820E-01	-0.7066E-02
	0.0229*	-0.0059
SEXCMP	-0.1394E-01	-0.6704E-02
	-0.0140	-0.0070
SESNINC1	0.6923E-01	0.4959E-01
	0.0853****	0.0632****
LFMINC1N	0.8850E-03	0.2231E-02
	0.0009	0.0025
VERBAL1	0.2756E-02	0.2042E-02
	0.0470**	0.0360*
MATHSD21	-0.1239E-02	-0.2138E-02
	-0.0222	-0.0396*
SCIHSD21	-0.1177E-02	-0.2877E-03
	-0.0221	-0.0056
CIVCSD21	0.9325E-03	0.8117E-03
	0.0176	0.0158
DROPOUT2	-0.1530	-0.1274
	-0.0995****	-0.0857****
EDASP1	0.8039E-02	0.6181E-02
	0.0430**	0.0343*
OCCASP1	0.7045E-05	0.5800E-04
	0.0003	0.0025
COLABL1	0.2363E-01	0.1483E-01
	0.0482***	0.0313*
AVGRAD1	-0.1085E-01	-0.6515E-02
	-0.0174	-0.0108
HOMWRK1	0.2382E-03	0.5212E-03
	0.0016	0.0037
CONCPT1	0.2630E-01	0.3472E-01
	0.0318**	0.0434****
PRCONCD	-0.2385E-01	-0.1577E-01
	-0.0142	-0.0098
PRLCONCD	0.6640E-03	0.7764E-03
	0.0005	0.0006
PRCONEXD	-0.3739E-01	-0.5048E-02
	-0.0231*	-0.0032
PRACADD	0.2112E-01	-0.1707E-01
	0.0063	-0.0053
CURINDX1	0.4385E-01	0.4287E-01
	0.0218	0.0220
ADJ R-SQ	0.0605	0.0493
NO./CASES	9730	9686

Notes: 1. Dependent variables cross columns; independent variables cross rows.
2. First entry in each pair of rows is the unstandardized coefficient, and the second entry is the standardized coefficient.

* p < .05 ** p < .01 *** p < .001 **** p < .0001

much longer than the HSB sophomore cohort. Those who were 21 at the time of the base-year survey (1979) would be out of high school 8-9 years or more at the time of the fifth follow-up conducted in 1984. A third difference is that the NLS data were collected by interview rather than by self-administered questionnaire; the NLS data appear to be more accurate, probably due in part to the method of administration. On the other hand, the NLS data do not contain good measures of career expectations, no measure of parental income while respondents were still in school, and only one administration of tests. Further, the tests were not administered in early high school for most of the sample. Last, the data needed to construct the curriculum index (CURINDX1) were not requested from NLS respondents; consequently, results are reported here for the profile variables and self-report curriculum track (academic, vocational, general). The self-report is viewed in part as a proxy for educational and occupational expectations measured during high school.

Results for the NLS sample are organized into four sections. The first summarizes findings for educational outcomes; the second treats crime. The third analyzes drug use, and the last deals with family variables.

Educational Outcomes

Nine educational outcomes are examined. These are (1) attended a 4-year college or university (ATN4YCOL), (2) completed a 4-year college or university (COM4YCOL), (3) attended a 2-year junior or community college (ATN2YCOL), (4) completed a 2-year junior or community college (COM2YCOL), (5) years of schooling completed (EDATTN6), (6) received government training after high school (RGTRNAHS), (7) completed government training after high school (CGTRNAHS), (8) received other training after high school (ROTRNAHS), and (9) completed other training after high school (COTRNAHS). Table 10 shows effect estimates for these outcomes.

As in the HSB sample, the curriculum variables do exercise fairly strong effects on attending and completing a 4-year college and on educational attainment. Being a vocational concentrator has a small but significantly negative effect on attendance and completion. Its effect on attainment is not significant, though it is negative. Being in the academic track as defined by the transcripts (ACADTRSC) has a small positive effect on attendance and attainment but not on completion. The self-report academic track (ACADMIC) has a strong positive effect on attendance and on attainment. These results likely are due to the omission of educational expectation from the specification.[8]

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[8] See the discussion in chapter 3 of this decision.

TABLE 10

EFFECT ESTIMATES OF CURRICULUM AND SELECTED OTHER VARIABLES ON POSTSECONDARY EDUCATION AND TRAINING: NLS YOUTH

Panel 1: Total Sample, No Expectation/Aspiration Variables

	ATN4YCOL	ATN2YCOL	CON4YCOL	CON2YCOL	EDATTN6	RGTRNAHS	CGTRNAHS	ROTRNAHS	COTRNAHS
RURAL14	-0.4110E-01 -0.0363	-0.2736E-01 -0.0276	-0.5765E-02 -0.0095	0.4012E-01 0.0842	0.8425E-02 0.0018	-0.4190E-01 -0.1056	-0.2331E-01 -0.0762	-0.2206E-01 -0.0222	-0.1396E-01 -0.0210
URBAN14	-0.1445E-01 -0.0128	-0.7886E-02 -0.0080	-0.2168E-02 -0.0036	0.3171E-01 0.0669	0.5311E-02 0.0012	-0.4418E-01 -0.1120	-0.1989E-01 -0.0654	-0.1861E-01 -0.0189	0.7233E-02 0.0109
SEX	-0.2212E-01 -0.0236*	0.2671E-01 0.0326*	-0.1177E-01 -0.0235	0.1344E-01 0.0341*	-0.7004E-01 -0.0185	0.3715E-02 0.0113	0.3217E-02 0.0127	0.5478E-01 0.0667****	0.1533E-01 0.0278*
BLACK	0.1488 0.1339****	0.6167E-01 0.0634****	0.3092E-01 0.0521****	0.7802E-02 0.0167	0.6248 0.1392****	0.1604E-01 0.0412**	0.1590E-01 0.0529****	0.2665E-01 0.0274*	0.2809E-02 0.0043
HISPANIC	0.6845E-01 0.0520****	0.6659E-01 0.0578****	0.7590E-02 0.0108	0.1525E-01 0.0275*	0.2970 0.0558****	0.6155E-02 0.0133	0.1238E-01 0.0348**	0.4445E-02 0.0039	0.3882E-02 0.0050
AGE	0.7818E-02 0.0366**	-0.8934E-02 -0.0478**	0.6460E-02 0.0566****	0.1418E-02 0.0158	0.8757E-01 0.1015****	0.2409E-02 0.0322*	0.4508E-02 0.0781****	0.1529E-01 0.0816****	0.1257E-01 0.0999****
MOINHH14	0.3639E-02 0.0018	-0.1458E-01 -0.0084	0.2739E-02 0.0026	-0.6523E-02 -0.0078	0.1576 0.0197*	-0.1192E-01 -0.0172	-0.4062E-02 -0.0076	-0.2684E-01 -0.0154	-0.5038E-02 -0.0043
SMINHH14	-0.6100E-01 -0.0155	-0.6414E-01 -0.0187	-0.1589E-01 -0.0076	-0.1353E-01 -0.0082	-0.3953E-01 -0.0025	-0.3638E-01 -0.0265*	-0.2157E-01 -0.0203	-0.3865E-01 -0.0112	-0.2502E-01 -0.0108
FAINHH14	0.1333E-01 0.0125	-0.3625E-02 -0.0039	0.5579E-02 0.0098	0.1426E-01 0.0318	0.1359E-01 0.0032	-0.1077E-02 -0.0029	0.4244E-02 0.0147	-0.9074E-02 -0.0097	0.4311E-02 0.0069
SFINHH14	-0.3069E-01 -0.0155	-0.9817E-02 -0.0057	-0.1337E-01 -0.0126	0.3427E-02 0.0041	-0.2612 -0.0326***	0.1143E-01 0.0164	0.1787E-02 0.0033	0.6300E-02 0.0036	0.1877E-01 0.0161
MTHSEI14	0.7777E-03 0.0260*	-0.6819E-04 -0.0026	0.3164E-03 0.0198	0.1612E-03 0.0128	0.6796E-03 0.0056	0.2294E-03 0.0219	0.2941E-04 0.0036	-0.4572E-03 -0.0174	0.4873E-04 0.0028
FTHSEI14	0.1215E-02 0.0438***	0.1102E-02 0.0454**	0.2625E-03 0.0177	0.9848E-04 0.0084	0.6318E-02 0.0565****	-0.1169E-03 -0.0120	-0.5488E-04 -0.0073	0.4019E-03 0.0165	-0.1629E-05 -0.0001
MTHEDC1	0.1067E-01 0.0636****	-0.1004E-02 -0.0068	0.1432E-02 0.0160	-0.1492E-02 -0.0212	0.3795E-01 0.0561****	-0.2260E-03 -0.0038	-0.9068E-04 -0.0020	-0.2876E-02 -0.0196	-0.2434E-03 -0.0025
FTHEDC1	0.1099E-01 0.0789****	0.2277E-02 0.0187	0.5287E-02 0.0711****	0.3821E-03 0.0065	0.5292E-01 0.0941****	-0.1027E-02 -0.0211	0.2119E-03 0.0056	0.4789E-02 0.0392**	0.1762E-02 0.0215
NSIBS1	0.7382E-04 0.0004	-0.2867E-02 -0.0176	0.6369E-04 0.0006	-0.2081E-02 -0.0266*	-0.2494E-01 -0.0333****	0.2839E-02 0.0436***	0.2527E-02 0.0504****	-0.2066E-02 -0.0127	0.6211E-03 0.0057
INTLANG	-0.1823E-01 -0.0151	-0.2405E-02 -0.0023	-0.2670E-03 -0.0004	-0.1035E-01 -0.0204	-0.5731E-01 -0.0118	-0.6434E-02 -0.0152	-0.4387E-02 -0.0135	-0.1192E-01 -0.0113	-0.2720E-02 -0.0038

Table 10 -- con't.

	ATN4YCOL	ATN2YCOL	CON4YCOL	CON2YCOL	EDATTNG	RGTRNAHS	CGTRNAHS	ROTRNAHS	COTRNAHS
VERBAL3	0.3639E-02	0.4001E-02	-0.1359E-02	0.2884E-03	0.1015E-01	-0.1931E-03	-0.1467E-03	0.6711E-03	0.1341E-02
	0.0830****	0.1043****	-0.0580**	0.0156	0.0573***	-0.0126	-0.0124	0.0175	0.0520*
MATH3	0.7991E-02	0.3455E-03	0.3723E-02	0.7190E-03	0.3667E-01	-0.2268E-03	0.9186E-04	0.1251E-02	0.3007E-03
	0.2385****	0.0118	0.2080****	0.0510**	0.2710****	-0.0193	0.0101	0.0426*	0.0152
TECHNCL3	-0.7065E-02	0.6236E-03	-0.2056E-02	-0.1972E-03	-0.2724E-01	0.1751E-03	-0.2095E-03	0.3851E-02	0.5017E-05
	-0.1325****	0.0134	-0.0722***	-0.0088	-0.1265****	0.0094	-0.0145	0.0824****	0.0002
SCITST3	0.8638E-02	-0.7031E-03	0.5227E-02	0.5048E-03	0.4198E-01	-0.3875E-04	0.2887E-03	-0.2089E-03	0.3353E-03
	0.0910****	-0.0085	0.1031****	0.0126	0.1095****	-0.0012	0.0113	-0.0025	0.0060
HSGRAD3	0.9169E-01	0.7578E-01	0.5039E-01	0.3295E-01	1.090	-0.4035E-02	-0.5020E-02	0.5567E-01	0.1831E-01
	0.0976****	0.0921****	0.1004****	0.0833****	0.2871****	-0.0123	-0.0198	0.0676****	0.0331*
GPA10	0.7709E-01	0.5754E-02	0.2862E-01	0.3971E-02	0.3038	-0.7696E-02	-0.5587E-02	-0.2163E-01	-0.3145E-02
	0.1252****	0.0107	0.0870****	0.0153	0.1222****	-0.0357**	-0.0336*	-0.0401**	-0.0087
CONCNTR	-0.8005E-01	0.3502E-01	-0.3914E-01	-0.8813E-02	-0.7082E-01	-0.2052E-01	-0.9506E-02	-0.1882E-01	0.6771E-03
	-0.0490****	0.0245*	-0.0449****	-0.0128	-0.0107	-0.0359**	-0.0216	-0.0132	0.0007
LCONC	-0.2702E-01	0.1676E-01	-0.1271E-01	0.3881E-02	0.1727	-0.1686E-01	-0.7827E-02	-0.1159E-01	-0.1464E-02
	-0.0203*	0.0144	-0.0179	0.0069	0.0321****	-0.0361**	-0.0217	-0.0099	-0.0019
CONEXPL	-0.3312E-01	0.2889E-01	-0.2914E-01	-0.8232E-02	0.1393	-0.3108E-02	0.8968E-02	-0.5343E-02	0.3487E-02
	-0.0136*	0.0196	-0.0323**	-0.0116	0.0204**	-0.0053	0.0197	-0.0036	0.0035
ACADTRSC	0.8077E-01	-0.7877E-01	0.1984E-01	-0.1758E-01	0.4712	-0.4964E-02	-0.5714E-02	-0.4715E-02	-0.1461E-02
	0.0368****	-0.0410***	0.0169	-0.0190	0.0531****	-0.0065	-0.0096	-0.0025	-0.0011
VOCTRK	-0.1193	-0.8164E-01	-0.4895E-01	0.1239E-01	0.5347	0.5415E-01	0.1186E-01	-0.2738E-01	0.2914E-01
	-0.0301**	-0.0235	-0.0231*	0.0074	0.0333****	0.0389**	0.0111	-0.0079	0.0125
ACADMIC	0.4532	0.1215	-0.7475E-01	0.3257E-01	1.538	-0.2197E-01	-0.6128E-02	-0.5625E-01	0.4067E-02
	0.1749****	0.0536****	-0.0540****	0.0299*	0.1470****	-0.0242	-0.0088	-0.0248	0.0027
ADJ R-SQ	0.3562	0.0424	0.1346	0.0223	0.5249	0.0159	0.0142	0.0416	0.0230
NO./CASES	8235	8235	8235	8235	8235	8235	8235	8235	8235

Table 10 -- con't.

Panel 2: Subsample of Respondents < 26 in 1979
Aspiration/Expectation Variables Included

	ATN4YCOL	ATN2YCOL	EDATTM6	RGTRNAHS	ROTRNAHS
RURAL14	-0.4571E-01	0.9605E-01	0.2217	0.1592E-01	0.1194E-02
	-0.0430	0.0995	0.0682	0.0463	0.0015
URBAN14	-0.2510E-01	0.9029E-01	0.8536E-01	0.1736E-01	-0.1892E-01
	-0.0237	0.0940	0.0264	0.0507	-0.0234
SEX	-0.3095E-03	0.4455E-02	-0.2653E-01	-0.5994E-02	0.6553E-01
	-0.0003	0.0055	-0.0097	-0.0207	0.0961***
BLACK	0.7338E-01	0.3830E-01	0.4771	-0.9177E-02	0.3622E-02
	0.0697**	0.0401	0.1482****	-0.0269	0.0045
HISPANIC	-0.1938E-01	0.3728E-01	0.1475	0.3468E-02	-0.5737E-01
	-0.0158	0.0336	0.0394*	0.0088	-0.0614*
AGE	0.2474E-01	-0.1570E-02	0.1743	0.1617E-01	0.2229E-01
	0.0298	-0.0021	0.0685****	0.0601**	0.0352
MOINHH14	0.1779E-01	0.2591E-01	0.2507	-0.3937E-01	-0.1645E-02
	0.0101	0.0163	0.0467*	-0.0693**	-0.0012
SMINHH14	0.1234E-01	-0.4560E-01	0.1520	-0.7028E-01	0.1438E-01
	0.0035	-0.0142	0.0141	-0.0615*	0.0053
FAINHH14	0.3137E-01	-0.2360E-01	0.1241	0.1130E-02	0.2900E-01
	0.0326	-0.0270	0.0421	0.0036	0.0395
SFINHH14	-0.6217E-01	-0.3136E-01	-0.3354	0.1347E-01	0.3475E-01
	-0.0352	-0.0196	-0.0621**	0.0236	0.0258
MTMSEI14	0.7640E-03	0.4568E-03	-0.3524E-02	-0.4342E-03	0.2563E-03
	0.0279	0.0184	-0.0421	-0.0491	0.0128
FTRSEI14	0.1335E-02	0.7541E-03	0.8448E-02	0.3235E-03	-0.6534E-03
	0.0508	0.0316	0.1051***	0.0381	-0.0326
MTHEDC1	0.8001E-02	0.2618E-03	0.1784E-01	0.1302E-02	-0.7595E-03
	0.0479*	0.0017	0.0350	0.0241	-0.0060
FTHEDC1	0.3744E-02	-0.3862E-02	0.1869E-01	-0.1471E-03	0.9597E-05
	0.0270	-0.0307	0.0441*	-0.0033	0.0001
MSIBS1	-0.1107E-03	-0.9584E-02	-0.2943E-01	0.3492E-02	-0.1339E-02
	-0.0006	-0.0591*	-0.0539**	0.0605*	-0.0098
INTLANG	-0.3045E-01	0.1311E-01	-0.4826E-01	-0.3053E-02	-0.1447E-01
	-0.0275	0.0131	-0.0143	-0.0085	-0.0172

Table 10 -- con't.

	ATN4YCOL	ATN2YCOL	EDATTN6	RGTRNAHS	ROTRNAHS
VERBAL3	0.2450E-02	-0.1437E-03	0.1363E-01	0.1293E-03	-0.1637E-02
	0.0490	-0.0032	0.0893**	0.0080	-0.0430
MATH3	0.8446E-02	-0.5140E-03	0.2328E-01	-0.1052E-02	0.8025E-03
	0.1686****	-0.0113	0.1520****	-0.0649	0.0210
TECHNCL3	-0.1484E-02	-0.4314E-03	-0.8262E-02	-0.1242E-02	0.4091E-02
	-0.0289	-0.0092	-0.0525	-0.0747	0.1043**
SCITST3	-0.1809E-03	0.3490E-02	0.4339E-02	0.9593E-03	-0.1572E-03
	-0.0037	0.0788*	0.0291	0.0607	-0.0042
MSGRAD3	0.9908E-01	-0.8361E-02	0.7536	0.1652E-01	0.5625E-01
	0.0356*	-0.0033	0.0885****	0.0183	0.0265
GPA10	0.7726E-01	0.1380E-01	0.2306	0.7292E-03	-0.1684E-01
	0.1342****	0.0264	0.1310****	0.0039	-0.0383
EDASP1	0.1078E-01	0.5791E-02	0.1868E-01	0.7407E-02	0.2803E-03
	0.0514	0.0304	0.0291	0.1092**	0.0018
EDEXP1	0.2826E-01	0.2657E-01	0.1210	-0.8234E-02	-0.2619E-02
	0.1352****	0.1400***	0.1892****	-0.1218**	-0.0164
SEIASP1	0.6228E-03	0.2677E-03	0.1079E-02	0.7028E-04	0.1190E-03
	0.0325	0.0154	0.0184	0.0113	0.0081
OCCMANC1	-0.1383E-02	0.1054E-01	-0.7649E-01	0.4461E-02	-0.3369E-02
	-0.0022	0.0182	-0.0391*	0.0216	-0.0069
CONCNTR	0.1332E-01	0.1239	0.4682	-0.2957E-01	-0.2501E-01
	0.0087	0.0897****	0.1005****	-0.0600**	-0.0215
LCONC	-0.2343E-02	0.1191	0.5460	-0.1951E-01	0.2966E-01
	-0.0019	0.1043****	0.1419****	-0.0479*	0.0309
CONEXPL	-0.1946E-01	0.1838E-01	0.3486	-0.1263E-01	-0.5050E-01
	-0.0125	0.0130	0.0732****	-0.0251	-0.0425
ACADTRSC	0.6462E-01	-0.8174E-01	0.1801	-0.6597E-02	-0.4521E-01
	0.0281	-0.0392	0.0257	-0.0089	-0.0258
VOCTRK	-0.9411E-01	-0.1379	0.4572	0.5917E-01	-0.3195E-01
	-0.0336	-0.0543*	0.0534**	0.0653**	-0.0150
ACADMIC	0.2699	0.3009E-01	0.8759	-0.1550E-01	-0.5201E-01
	0.1565****	0.0192	0.1661****	-0.0278	-0.0396
ADJ R-SQ	0.3553	0.0668	0.4561	0.0206	0.0114
NO./CASES	2155	2155	2155	2155	2155

Notes: 1. First coefficient in each pair of rows is unstandardized; the second coefficient is standardized.
2. Dependent variables cross columns; independent variables cross rows.
3. First entry in each pair of rows is the unstandardized coefficient; the second entry is the standardized coefficient.

* p < .05 ** p < .01 *** p < .001 **** p < .0001

It is curious, however, that the effect of self-report academic track on college completion is negative! This phenomenon very likely is due to the fact that the tests, particularly math and science, are associated with very strong coefficients in the equation for college completion. In many instances, as noted in chapter 3, respondents took the tests after they completed part or all of their college. Hence, the strong positive coefficients on the tests may be in large part due to the effects of college on the tests rather than the effects of the tests on college completion. Certainly, evidence from the HSB sample indicates that educational experience during high school has a strong effect on growth in the test scores. Dropping out has a strong negative effect on them.

It is interesting indeed that the absence of effects on postsecondary participation in nonbaccalaureate degree programs found in the HSB data tends to be repeated here, although being a concentrator does have a small positive effect on attendance at a junior college. One might expect that being a vocational concentrator, for example, would have a positive effect on propensity to engage in technical training after leaving high school, but one of the two statistically significant coefficients in this connection is negative--concentrators are less likely to receive government training than general students. Concentrators are slightly more likely to attend a 2-year college than are general students.

The R-squares for college attendance and educational attainment are higher than comparable R-squares in the HSB data. There are several possible reasons for this. First, we expect higher R-squares on educational outcomes as a sample ages, because a higher proportion of respondents will have completed their schooling, thus generating higher variance in the dependent variable. Second, the NLS data were collected by interview and probably are more accurate because of this fact. Third, some part of the high correlations may be due to confounding of cause and effect with respect to the test scores, as discussed above.

Because of the difficulties associated with omission of educational and occupational aspirations/expectations from the equations in panel 1 of table 10, a new set of estimates was calculated which included educational aspirations at base year (EDASP1), educational expectation at base year (EDEXP1), occupational aspiration at base year in Duncan SEI units (SEIASP1), and respondent's judgment (measured at base year) regarding the chance of achieving his or her occupational aspiration (OCCHANC1). To avoid the problems that arise in the case of respondents who were not in early high school or junior high when these aspiration/expectation variables were first asked, the sample for these calculations was restricted to respondents who were under 16 years old at base year. Since few respondents aged 15 and younger in 1979 would have been able to complete a 4-year college education by 1984, COM4YCOL was omitted from the analysis. Completion of a 2-year college and completion of government or other training were also omitted because of low R-squares and few significant coefficients. The data are shown in panel 2 of table 10.

The results are quite revealing. After controlling for educational and occupational expectations/aspirations, all tendencies for vocational students to be less likely to attend a 4-year college vanish. None of the coefficients on the vocational profiles is statistically significant, and all are very close to 0. In contrast, to the results in panel 1 of table 10, it is now found that youths who took vocational curriculum in high school are more likely to attend a 2-year college than general students; this is true of both concentrators and limited concentrators. The most interesting pattern of coefficients in this set of findings is observed for years of education (EDATTNG). With the controls for career aspirations in place, concentrators, limited concentrators, and concentrator explorers all achieve more years of postsecondary schooling than general students. These effects are relatively strong. For example, the estimates indicate that both concentrators and limited concentrators have about 1/2 year more years of postsecondary schooling than do general students.

It also is noteworthy that, of the career aspirations/expectations variables, only educational expectation exhibits significant effects. These effects are strong, however. Anomalously, self-report academic track (ACADMIC1) still has strong effects on 4-year college attendance and years of education completed. The self-report academic track (ACADMIC1) still has strong effects on attendance at at a 4-year college and amount of schooling completed, even with controls for career aspirations/expectations.

The findings here differ from findings with the HSB data. In the HSB, the vocational profile variables are estimated to have negative effects on 4-year college enrollment and amount of time in postsecondary schooling since high school. Effects on junior college enrollment and enrollment in a vocational school were found to be negligible. Reasons for these discrepancies between the two samples are not clear. One possibility, however, is that the control for high school dropout is inadequate to compensate for the fact that all youth who were out of school by 1979 or 1980 would be classified into the general curriculum because they would have accumulated insufficient credits to be classified elsewhere. This situation does not occur with the HSB sample because all respondents were in school at base year.

Delinquency and Crime Outcomes

Four outcomes defined as delinquent or criminal behavior are investigated. The first is an index of the frequency of nonserious crimes (NSCRIME). The second is an index of serious crimes (SERCRIME). The third measure is an estimate of the percentage of one's income gained through illegal activities (ILLINC2). The last measure of criminal behavior is the respondent's report of times stopped by police in the year prior to the interview (PSTOPLY2). Table 11 contains estimates of effects on these 4 outcomes.

All of the R-squares are small, but there is an interpretable pattern in the coefficients. Youth who get good grades in high school, graduate from high school, are from a middle-class home, and perceive themselves to be in the academic track all are associated with diminished criminal activity. This pattern is consistent with findings in delinquency research and with "strain" theory (reviewed briefly in chapter 1). The signs of the coefficients associated with vocational profiles also are negative, implying that vocational students are less prone to deviance than general students. However, few of these coefficients are statistically significant.

Tobacco, Alcohol, and Drug-Use Outcomes

Twelve variables summarizing substance use are included in the analyses. These include one indicator of tobacco use--number of tobacco cigarettes smoked per day in the month prior to the interview (NCIGSLM6). Two variables describing alcohol use are included. Both are defined as an index of several variables describing alcohol use. The components include items like number of drinks last month, number of times went to a bar last month, does drinking interfere with schooling, and does drinking interfere with work. One measure is defined from interview 4 (ALCOHLU4), and the other is defined from interview 5 (ALCOHLU5). Five variables associated with marijuana use are included. These are number of times smoked marijuana last year (SMKPOT2), number of times sold marijuana last year (SLDPOT2), lifetime use of marijuana (LTPOTU6), number of months since last smoked marijuana (NSPOTMS6), and number of times smoked marijuana last month (NSPOTLM6). Four variables describing use of drugs other than marijuana are included. These are number of times used drugs other than marijuana last year (UOTHDRG2), number of times sold other drugs last year (SOTHDRG2), lifetime use of drugs other than marijuana (LTDRUGU6), and number of times used other drugs last month (UOTHDRG6). Table 12 contains the results of the analyses.

The data in table 12 reveal that being a vocational concentrator tends to inhibit use of and selling of marijuana and use of other drugs (negative signs on SMKPOT2, SLDPOT2, and UOTHDRG2). Although the other coefficients associated with being a concentrator are not significant, all are negative except the first measure of alcohol use (ALCOHLU4). There also is some tendency for being a limited concentrator and concentrator/explorer to reduce drug use as compared to general students. The strongest effects are on the self-report academic student. Those who perceive themselves to be an academic student in high school are less likely to use alcohol, smoke tobacco cigarettes, use marijuana, or use other drugs. Also, high grades in school tend to help prevent tobacco, alcohol, and drug use. High test scores

TABLE 11

EFFECT ESTIMATES OF CURRICULUM AND SELECTED OTHER VARIABLES ON CRIMINAL BEHAVIOR: NLS YOUTH

	NSRCRIME	SERCRIME	ILLINC2	PSTOPLY2
RURAL14	-0.8067	0.2500	0.3952E-02	-0.2198E-01
	-0.1135	0.0459	0.0168	-0.0054
URBAN14	-0.6918	0.3303	0.1138E-01	0.7037E-01
	-0.0979	0.0610	0.0487	0.0175
SEX	-0.7825	-0.4667	-0.1904E-01	-0.3913
	-0.1268****	-0.1026****	-0.0971****	-0.1157****
BLACK	-0.1259	0.6478E-01	-0.2974E-03	-0.5987E-01
	-0.0179	0.0120	-0.0013	-0.0149
HISPANIC	-0.5135E-01	-0.1871	-0.6410E-02	0.9616E-01
	-0.0061	-0.0292*	-0.0232	0.0201
AGE	-0.9136E-01	-0.2220E-01	-0.2010E-02	-0.1318E-01
	-0.0674****	-0.0214	-0.0449**	-0.0171
MOINHH14	-0.4860E-02	0.2986	0.1185E-01	0.6227E-01
	-0.0004	0.0307*	0.0283*	0.0086
SMINHH14	0.6641	0.4500	0.1808E-01	0.3904
	0.0265*	0.0234	0.0218	0.0273*
FAINHH14	-0.1427	-0.2392	-0.4028E-02	-0.1669
	-0.0210	-0.0460*	-0.0180	-0.0432*
SFINHH14	0.9887E-01	-0.4128E-01	-0.9935E-03	-0.2139
	0.0079	-0.0043	-0.0024	-0.0298*
MTHSEI14	-0.7629E-03	0.8890E-03	0.2442E-04	0.2352E-02
	-0.0040	0.0062	0.0039	0.0219
FTHSEI14	-0.1118E-02	-0.1232E-02	0.8194E-04	0.6588E-04
	-0.0064	-0.0092	0.0142	0.0007
MTHEDC1	0.1325E-01	0.1100E-01	0.3056E-03	0.1105E-01
	0.0126	0.0136	0.0088	0.0184
FTHEDC1	0.1360E-01	-0.3838E-02	0.5812E-04	-0.4075E-02
	0.0155	-0.0057	0.0020	-0.0082
NSIBS1	0.1899E-01	0.8714E-02	-0.1582E-03	-0.4535E-02
	0.0161	0.0097	-0.0041	-0.0068
NATLANG	0.2102	0.1175	0.8279E-02	0.4595E-01
	0.0273*	0.0199	0.0325**	0.0105
VERBAL3	0.1315E-01	0.9577E-02	-0.7838E-03	0.2877E-02
	0.0477*	0.0453	-0.0860***	0.0183
MATH3	0.2025E-02	-0.1145E-03	0.1370E-03	-0.2289E-02
	0.0096	-0.0007	0.0197	-0.0191
TECHNCL3	0.2322E-02	-0.3723E-03	-0.3054E-03	0.8171E-02
	0.0069	-0.0014	-0.0275	0.0427
SCITST3	-0.5198E-04	0.2360E-02	-0.8882E-04	-0.2846E-03
	-0.0001	0.0052	-0.0045	-0.0008
HSGRAD3	-0.2927	-0.2833	-0.7151E-02	-0.6485E-01
	-0.0491**	-0.0620****	-0.0363*	-0.0191
GPA10	-0.2709	-0.2275	-0.6782E-02	-0.1408
	-0.0695****	-0.0762****	-0.0527****	-0.0634****
CONCNTR	-0.1534	-0.9311E-01	-0.4702E-02	-0.4451E-02
	-0.0149	-0.0118	-0.0138	-0.0008
LCONC	-0.1451	-0.4594E-01	-0.7267E-02	-0.1406
	-0.0174	-0.0072	-0.0263*	-0.0295*
CONEXPL	-0.2291	0.1347E-01	-0.7379E-02	-0.6823E-01
	-0.0218	0.0017	-0.0212	-0.0114
ACADTRSC	-0.1905	-0.7096E-01	-0.4851E-03	-0.1508
	-0.0138	-0.0067	-0.0011	-0.0192
VOCTRK	-0.3098	-0.2181	-0.3026E-02	-0.1217
	-0.0125	-0.0115	-0.0037	-0.0086
ACADMIC	-0.7003	-0.9243E-01	-0.2482E-01	-0.4539
	-0.0438**	-0.0075	-0.0470***	-0.0498***
ADJ R-SQ	0.0354	0.0239	0.0385	0.0290
NO./CASES	7425	7425	7425	7425

Notes: 1. Dependent variables cross columns; independent variables cross rows.
2. First entry in each pair of rows is the unstandardized coefficient; the second entry is the standardized coefficient.

* p < .05 ** p < .01 *** p < .001 **** p < .0001

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TABLE 11

EFFECT ESTIMATES OF CURRICULUM AND SELECTED OTHER VARIABLES ON CRIMINAL BEHAVIOR: NLS YOUTH

	NSRCRIME	SERCRIME	ILLINC2	PSTOPLY2
RURAL14	-0.8067	0.2500	0.3952E-02	-0.2198E-01
	-0.1135	0.0459	0.0168	-0.0054
URBAN14	-0.6918	0.3303	0.1138E-01	0.7037E-01
	-0.0979	0.0610	0.0487	0.0175
SEX	-0.7526	-0.4667	-0.1904E-01	-0.3913
	-0.1268****	-0.1026****	-0.0971****	-0.1157****
BLACK	-0.1259	0.6478E-01	-0.2974E-03	-0.5987E-01
	-0.0179	0.0120	-0.0013	-0.0149
HISPANIC	-0.5135E-01	-0.1871	-0.6410E-02	0.9616E-01
	-0.0061	-0.0292*	-0.0232	0.0201
AGE	-0.9136E-01	-0.2220E-01	-0.2010E-02	-0.1318E-01
	-0.0674****	-0.0214	-0.0449**	-0.0171
MOINHH14	-0.4860E-02	0.2986	0.1185E-01	0.6227E-01
	-0.0004	0.0307*	0.0283*	0.0086
SMINHH14	0.6641	0.4500	0.1808E-01	0.3904
	0.0265*	0.0234	0.0218	0.0273*
FAINHH14	-0.1427	-0.2392	-0.4028E-02	-0.1669
	-0.0210	-0.0460*	-0.0180	-0.0432*
SFINHH14	0.9887E-01	-0.4128E-01	-0.9935E-03	-0.2139
	0.0079	-0.0043	-0.0024	-0.0298*
MTHSEI14	-0.7629E-03	0.8890E-03	0.2442E-04	0.2352E-02
	-0.0040	0.0062	0.0039	0.0219
FTHSEI14	-0.1118E-02	-0.1232E-02	0.8194E-04	0.6588E-04
	-0.0064	-0.0092	0.0142	0.0007
MTHEDC1	0.1325E-01	0.1100E-01	0.3056E-03	0.1105E-01
	0.0126	0.0136	0.0088	0.0184
FTHEDC1	0.1360E-01	-0.3838E-02	0.5812E-04	-0.4075E-02
	0.0155	-0.0057	0.0020	-0.0082
NSIBS1	0.1899E-01	0.8714E-02	-0.1582E-03	-0.4535E-02
	0.0161	0.0097	-0.0041	-0.0068
INTLANG	0.2102	0.1175	0.8279E-02	0.4595E-01
	0.0273*	0.0199	0.0325**	0.0105
VERBAL3	0.1315E-01	0.9577E-02	-0.7838E-03	0.2877E-02
	0.0477*	0.0453	-0.0860***	0.0183
MATH3	0.2025E-02	-0.1145E-03	0.1370E-03	-0.2289E-02
	0.0096	-0.0007	0.0197	-0.0191
TECHNCL3	0.2322E-02	-0.3723E-03	-0.3054E-03	0.8171E-02
	0.0069	-0.0014	-0.0275	0.0427
SCITST3	-0.5198E-04	0.2360E-02	-0.8882E-04	-0.2846E-03
	-0.0001	0.0052	-0.0045	-0.0008
HSGRAD3	-0.2927	-0.2833	-0.7151E-02	-0.6485E-01
	-0.0491**	-0.0620****	-0.0363*	-0.0191
GPA10	-0.2709	-0.2275	-0.6782E-02	-0.1408
	-0.0695****	-0.0762****	-0.0527****	-0.0634****
CONCNTR	-0.1534	-0.9311E-01	-0.4702E-02	-0.4451E-02
	-0.0149	-0.0118	-0.0138	-0.0008
LCONC	-0.1451	-0.4594E-01	-0.7267E-02	-0.1406
	-0.0174	-0.0072	-0.0263*	-0.0295*
CONEXPL	-0.2291	0.1347E-01	-0.7379E-02	-0.6823E-01
	-0.0218	0.0017	-0.0212	-0.0114
ACADTRSC	-0.1905	-0.7096E-01	-0.4851E-03	-0.1508
	-0.0138	-0.0067	-0.0011	-0.0192
VOCTRK	-0.3098	-0.2181	-0.3026E-02	-0.1217
	-0.0125	-0.0115	-0.0037	-0.0086
ACADMIC	-0.7003	-0.9243E-01	-0.2482E-01	-0.4539
	-0.0438**	-0.0075	-0.0470***	-0.0498***
ADJ R-SQ	0.0354	0.0239	0.0385	0.0290
NO./CASES	7425	7425	7428	7425

Notes: 1. Dependent variables cross columns; independent variables cross rows.
2. First entry in each pair of rows is the unstandardized coefficient; the second entry is the standardized coefficient.

* p < .05 ** p < .01 *** p < .001 **** p < .0001

TABLE 12

EFFECT ESTIMATES OF CURRICULUM AND SELECTED OTHER VARIABLES ON SUBSTANCE USE: NLS YOUTH

	ALCOHLU4	ALCOHLU5	NCIGSLM6	SMKPOT2	UOTHDRG2	SLDPOT2
RURAL14	-0.5776E-01	-0.1427E-01	3.938	-0.3768	-1.102	-1.021
	-0.0353	-0.0088	0.1426	-0.0609	-0.2652*	-0.3038*
URBAN14	-0.5226E-01	-0.2658E-01	4.164	-0.1402	-0.9656	-0.8666
	-0.0322	-0.0160	0.1514	-0.0228	-0.2338	-0.2596
SEX	-0.2352	-0.2230	-0.3485	-0.1033	0.1337	-0.2297
	-0.1759****	-0.2364****	-0.0153	-0.0206	0.0393	-0.0836**
BLACK	-0.2247	-0.2242	-4.887	-0.3114	-0.3049	-0.1002
	-0.1323****	-0.1291****	-0.1702****	-0.0484*	-0.0706**	-0.0287
HISPANIC	-0.5261E-01	-0.1146	-5.866	-0.2491E-01	-0.7665E-01	-0.9322E-01
	-0.0264	-0.0563*	-0.2042****	-0.0033	-0.0151	-0.0228
AGE	0.2155E-01	0.2290E-02	0.7342E-01	0.3396E-01	0.3733E-01	-0.3394E-01
	0.0694**	0.0073	0.0140	0.0289	0.0473	-0.0532*
MOINHH14	-0.1599	-0.1494	-2.200	-0.1301	0.7517E-01	-0.3523E-01
	-0.0533*	-0.0487	-0.0434	-0.0118	0.0098	-0.0057
SMINHH14	0.2928E-01	-0.1877	-0.6790	-0.6867E-01	0.2285	0.1312
	0.0056	-0.0354	-0.0077	-0.0035	0.0173	0.0123
FAINHH14	-0.5481E-01	-0.5181E-01	-0.7921	-0.4694	-0.9351E-01	-0.1592
	-0.0357	-0.0330	-0.0308	-0.0808*	-0.0239	-0.0504
SFINHH14	-0.1745E-01	-0.7186E-01	0.8142	0.1864	0.1829	0.1685
	-0.0064	-0.0257	0.0176	0.0181	0.0263	0.0300
MTHSEI14	0.1349E-02	-0.7332E-03	-0.2306E-01	0.1020E-02	0.8613E-03	0.3708E-02
	0.0319	-0.0169	-0.0322	0.0064	0.0080	0.0426
FTHSEI14	-0.1102E-02	-0.1024E-03	-0.2123E-01	0.2540E-02	0.5000E-03	-0.1286E-02
	-0.0283	-0.0026	-0.0323	0.0172	0.0050	-0.0161
MTHEDC1	0.4377E-02	-0.1901E-02	0.1122	0.6789E-01	0.1083E-01	0.2755E-01
	0.0173	-0.0073	0.0262	0.0709**	0.0168	0.0529*
FTHEDC1	-0.1509E-03	0.8171E-02	0.3401E-02	0.1371E-01	0.1549E-01	0.1090E-02
	-0.0007	0.0389	0.0010	0.0176	0.0297	0.0026
NSIBS1	0.2706E-02	0.3873E-02	0.8802E-01	-0.4217E-03	-0.4293E-01	-0.1380E-01
	0.0098	0.0128	0.0189	-0.0004	-0.0613**	-0.0244
INTLANG	0.6307E-01	0.6779E-01	-1.417	-0.1074	0.1687	0.6031E-01
	0.0375	0.0394*	-0.0498*	-0.0159	0.0394	0.0174
VERBAL3	0.3060E-02	0.3008E-02	0.1156	0.4738E-01	0.1739E-01	0.1124E-01
	0.0478	0.0460	0.1070**	0.1957****	0.1068**	0.0655*
MATH3	0.2161E-02	0.3694E-02	-0.1493	-0.1283E-01	-0.3760E-02	-0.7678E-02
	0.0446	0.0746*	-0.1824****	-0.0700*	-0.0305	-0.0771*
TECHNCL3	0.7012E-03	0.3675E-03	0.6321E-01	0.7940E-02	0.1119E-01	0.1142E-01
	0.0092	0.0047	0.0491	0.0275	0.0577	0.0728
SCITST3	-0.5154E-02	-0.1978E-02	-0.1020	-0.1855E-03	0.1580E-01	-0.1919E-02
	-0.0373	-0.0140	-0.0437	-0.0004	0.0450	-0.0068
HSGRAD3	-0.6393E-01	-0.8250E-01	-0.7776	-0.1336	-0.1773	-0.1248
	-0.0479	-0.0605*	-0.0345	-0.0264	-0.0522*	-0.0488
GPA10	-0.8100E-01	-0.1091	-1.862	-0.5628	-0.2588	-0.1433
	-0.0919****	-0.1212****	-0.1250****	-0.1687****	-0.1154****	-0.0791***
CONCNTR	0.4726E-01	-0.3229E-01	-0.3415	-0.6548	-0.3555	-0.2573
	0.0204	-0.0136	-0.0087	-0.0747***	-0.0604**	-0.0541*
LCONC	-0.4265E-01	0.9543E-02	1.219	-0.3190	-0.2575	-0.1239
	-0.0220	0.0048	0.0371	-0.0434*	-0.0521*	-0.0335
CONEXPL	-0.1634E-01	-0.1271	-0.6942	-0.4294	-0.1817	-0.2129
	-0.0065	-0.0497*	-0.0164	-0.0464*	-0.0286	-0.0414*
ACADTRSC	-0.2506E-02	-0.3447E-01	-1.373	-0.4276	-0.4058	-0.7963E-01
	-0.0008	-0.0106	-0.0255	-0.0354	-0.0500*	-0.0121
VOCTRK	0.5159E-01	-0.1719	-0.8078	-0.5270	-0.4876	0.8762E-01
	0.0089	-0.0290	-0.0082	-0.0240	-0.0330	0.0073
ACADMIC	-0.2450	-0.6838E-01	-7.131	-2.087	-0.9497	-0.6978
	-0.0644**	-0.0176	-0.1109****	-0.1449****	-0.0981****	-0.0892***
ADJ R-SQ	0.0652	0.0942	0.1190	0.0938	0.0790	0.0649
NO./CASES	2412	2412	2412	2412	2412	2412

Table 12 — con't.

	SOTHDRG2	LTPOTUG	NSPOTLNG	NSPOTNSG	LTDRGUG	UOTHDRG6
RURAL14	-0.3098	-82.80	3.411	2.273	-163.2	0.1924
	-0.2210	-0.0851	0.1456	0.0552	-0.1392	0.0089
URBAN14	-0.3069	-24.32	4.023	5.715	-144.1	0.5331
	-0.2204	-0.0282	0.1728	0.0970	-0.1238	0.0249
SEX	-0.6299E-02	-63.57	-1.516	-5.233	5.234	0.1202
	-0.0055	-0.0799**	-0.0791**	-0.1076****	0.0055	0.0068
BLACK	-0.2155E-01	-10.82	1.554	1.990	-39.60	0.1834
	-0.0148	-0.0107	0.0638*	0.0323	-0.0325	0.0082
HISPANIC	-0.8794E-02	-24.94	0.1002	-0.1181	-28.88	0.2795
	-0.0052	-0.0210	0.0035	-0.0016	-0.0202	0.0106
AGE	0.3726E-03	5.845	0.5263E-01	-0.4678	11.64	0.44[illegible]6E-01
	0.0014	0.0316	0.0118	-0.0415	0.0523	0.0110
MOINHH14	-0.1430E-01	-63.43	1.109	-3.827	-247.9	-4.266
	-0.0056	-0.0355	0.0258	-0.0351	-0.1152****	-0.1078****
SMINHH14	0.3979E-01	-41.62	3.184	-1.782	-201.5	-3.136
	0.0089	-0.0135	0.0428	-0.0093	-0.0542*	-0.0458
FAINHH14	-0.3758E-01	-30.43	-0.6644	-3.400	-32.87	-0.2209
	-0.0285	-0.0333	-0.0302	-0.0610	-0.0298	-0.0109
SFINHH14	0.4873E-01	77.36	-0.1774	0.5518	-34.21	-0.2006E-01
	0.0208	0.0475	-0.0045	0.0056	-0.0174	-0.0006
MTHSEI14	-0.1371E-02	-0.7126	-0.2271E-01	-0.3295E-01	-0.9334E-02	-0.7491E-03
	-0.0377	-0.0283	-0.0374	-0.0214	-0.0003	-0.0013
FTHSEI14	0.2138E-02	1.456	0.2665E-01	0.8136E-01	0.5784E-01	-0.6117E-02
	0.0640*	0.0628*	0.0477	0.0576	0.0021	-0.0119
MTHEDC1	0.3150E-02	4.006	0.1114	0.4680	4.384	0.8978E-03
	0.0145	0.0266	0.0307	0.0509	0.0241	0.0003
FTHEDC1	-0.4115E-02	2.477	0.1455	0.1850	6.199	0.1353
	-0.0234	0.0203	0.0494	0.0248	0.0421	0.0499
MSIBS1	-0.9743E-02	2.276	0.2070E-01	0.2532	-7.021	-0.1238
	-0.0412	0.0[illegible]39	0.0052	0.0253	-0.0355	-0.0341
INTLANG	0.5212E-01	8.830	0.2086	-1.261	-22.47	-0.7573E-01
	0.036[illegible]	0.0088	0.0086	-0.0206	-0.0186	-0.0034
VERBAL3	0.2567E-02	1.619	-0.2674E-01	0.9566E-01	-0.2637	-0.4962E-01
	0.0468	0.0425	-0.0291	0.0412	-0.0057	-0.0588
MATH3	-0.2815E-02	-2.186	-0.2960E-01	-0.6281E-01	-1.069	-0.3627E-02
	-0.0678	-0.0758*	-0.0426	-0.0357	-0.0208	-0.0057
TECHNCL3	0.3629E-02	4.673	0.2776E-01	0.1268	4.609	0.4915E-02
	0.0555	0.1030**	0.0254	0.0458	0.0843*	0.0049
SCITST3	-0.8992E-03	1.454	0.6272E-01	0.5605E-01	0.3413	0.4829E-01
	-0.0076	0.0177	0.0317	0.0112	0.0034	0.0265
HSGRAD3	-0.5930E-01	-68.32	-1.528	-2.019	-93.10	-0.8628
	-0.0518	-0.0860**	-0.0798**	-0.0417	-0.0972***	-0.0490
GPA10	-0.1606E-01	-44.71	-0.7600	-2.857	-31.16	-0.4424E-01
	-0.0212	-0.0852***	-0.0601*	-0.0893***	-0.0493*	-0.0038
CONCNTR	-0.5271E-01	-9.312	-0.1899	-2.009	-18.96	-0.1375
	-0.0265	-0.0068	-0.0057	-0.0239	-0.0114	-0.0045
LCONC	-0.1072E-01	-27.62	-0.6219	-1.362	10.02	-0.6478E-01
	-0.0064	-0.0239	-0.0223	-0.0193	0.0072	-0.0025
CONEXPL	-0.5621E-01	-57.73	-1.085	-3.917	-18.62	-0.4194
	-0.0262	-0.0388	-0.0302	-0.0431*	-0.0104	-0.0127
ACADTRSC	-0.9741E-02	-28.31	-0.1036	-3.136	-40.92	-0.9417
	-0.0036	-0.0149	-0.0023	-0.0271	-0.0179	-0.0224
VOCTRK	-0.5110E-01	64.79	3.790	-2.747	66.34	-1.451
	-0.0103	0.0187	0.0455*	-0.0130	0.0159	-0.0189
ACADMIC	-0.6747E-01	-144.1	-1.746	-14.99	-126.8	-0.7797
	-0.0207	-0.0636**	-0.0320	-0.1085****	-0.0463	-0.0155
ADJ R-SQ	0.0073	0.0577	0.0346	0.0481	0.0261	0.0065
NO./CASES	2412	2412	2412	2412	2412	2412

Notes: 1. Dependent variables cross columns; independent variables cross rows.
2. First entry in each pair of rows is the unstandardized coefficient; the second entry is the standardized coefficient.

* p < .05 ** p < .01 *** p < .001 **** p < .0001

also tend to be associated with less substance use. These results all are in agreement with "strain" theory. Thus, the key hypothesis in strain theory, that failure to achieve according to conventional standards leads to deviant ways to be successful and to escapism, is supported in both the analysis of criminal behavior and the analysis of substance use.

Marriage and Family Outcomes

There are 8 dependent variables in the analysis of marriage and family outcomes. Three of these match those used in the HSB analysis. These are occurence of a marriage since high school (MARAHS), having a child since high school (PARENT6), and number of children born since high school (NCHILD6). The remaining 5 have to do with medical care for one's children and are measured only for females with children. The child-care variables are: an index of DPT (diphtheria, pertussis, tetanus) inoculations for the youngest child in 1983 and 1984 (NDPTYC), an index of measles shots for the youngest child in 1983 and 1984 (MSHOTYC), an index of prenatal care in 1983 and 1984 (PRENATL), month in pregnancy first received prenatal care (PNMONTH), and an index of "well baby care" in 1983 and 1984 (WELLBC). Results for the first 3 variables are tabulated in table 13. Gender and ever married are entered into each equation as linear components in lieu of carrying out separate analyses by gender and ever married as done in the HSB analyses. Data for the child care variables are shown in table 14.

Unlike the results using the HSB data, calculations reported in table 13 indicate that high school curriculum does have some influence on fertility. Limited concentrators, academic track (transcript), vocational track (self-report), and academic track (self-report), are less fertile than general students. The reason for the discrepancies between the estimates using NLS data and those using HSB are not clear. The differences possibly are due to the differences between the specifications of the statistical models for the two samples. With HSB, the analyses included a large array of base-year controls, such as educational expectation and age at which one expected to have first child, and were conducted separately by gender and ever married. To check whether these differences in specification account for the different results, an analysis was conducted with the HSB data closely paralleling the one reported in table 13 on the NLS. The results of this additional analysis still do not match the findings with NLS Youth. A second possible reason for the discrepancy between the two sets of findings may derive from the distinctive structures of the two samples. It is possible, for example, that 2 years after high school is an insufficient amount of elapsed Table time for the effects observed in the NLS sample to materialize. Because the post-high school data in the HSB were collected after 2 years following high school, and the NLS sample spans a much longer time after high school, this could account for the discrepancy in findings.

TABLE 13

EFFECT ESTIMATES OF CURRICULUM AND SELECTED OTHER VARIABLES ON FAMILY OUTCOMES: NLS YOUTH

	MARAHS	PARENT6	NCHILD6
RURAL14	0.6218E-01	-0.9410E-01	-0.2420E-01
	0.1006	-0.0998	-0.0153
URBAN14	0.6074E-01	-0.7617E-01	-0.4324E-02
	0.0989	-0.0813	-0.0028
SEX	0.6588E-01	0.1776	0.2884
	0.1320****	0.2331****	0.2264****
BLACK	-0.7146E-01	0.1626	0.2329
	-0.1277****	0.1904****	0.1631****
HISPANIC	-0.2278E-01	0.3144E-02	-0.1277E-01
	-0.0323*	0.0029	-0.0071
AGE	0.2819E-01	0.3546E-01	0.7541E-01
	0.2426****	0.2000****	0.2543****
MOINHH14	-0.3083E-01	-0.5247E-01	-0.1019
	-0.0300*	-0.0335*	-0.0389**
SMINHH14	-0.3223E-01	-0.8631E-01	-0.8577E-01
	-0.0148	-0.0260	-0.0155
FAINHH14	-0.1783E-01	-0.3713E-01	-0.4432E-01
	-0.0320	-0.0437*	-0.0312
SFINHH14	0.2429E-01	0.4095E-01	0.7866E-01
	0.0220	0.0243	0.0279
MTHSEI14	-0.3045E-03	-0.1819E-03	-0.1425E-03
	-0.0196	-0.0077	-0.0036
FTHSEI14	-0.2569E-03	-0.5071E-03	-0.1326E-02
	-0.0176	-0.0228	-0.0357
MTHEDC1	0.9650E-03	-0.4201E-02	-0.6495E-02
	0.0109	-0.0312	-0.0288
FTHEDC1	-0.2297E-02	-0.8080E-03	-0.9378E-03
	-0.0312	-0.0072	-0.0050
NSIBS1	0.1250E-02	0.6781E-02	0.9285E-02
	0.0128	0.0457***	0.0374**
INTLANG	-0.3906E-02	0.1746E-01	0.2265E-01
	-0.0063	0.0184	0.0142
VERBAL3	-0.2732E-03	-0.4977E-02	-0.1115E-01
	-0.0102	-0.1222****	-0.1637****
MATH3	-0.2078E-02	-0.1871E-02	-0.1132E-02
	-0.0805***	-0.0475*	-0.0172
TECHNCL3	0.1022E-02	0.3943E-02	0.5803E-02
	0.0392	0.0990****	0.0872***
SCITST3	-0.3974E-03	0.3761E-03	0.1478E-02
	-0.0154	0.0096	0.0225
HSGRAD3	-0.5129E-01	-0.9374E-01	-0.1965
	-0.1030****	-0.1234****	-0.1547****
GPA10	0.1593E-02	-0.2702E-01	-0.3857E-01
	0.0049	-0.0549***	-0.0469**
CONCNTR	-0.1304E-01	-0.2289E-01	-0.4479E-01
	-0.0147	-0.0169	-0.0197
LCONC	-0.7690E-02	-0.3345E-01	-0.8522E-01
	-0.0107	-0.0306*	-0.0466***
COMEXPL	-0.1076E-01	-0.2653E-01	-0.4730E-01
	-0.0115	-0.0186	-0.0199
ACADTRSC	-0.2504E-01	-0.4433E-01	-0.6120E-01
	-0.0224	-0.0259*	-0.0214
VOCTRK	-0.4072E-01	-0.1415	-0.2304
	-0.0204	-0.0465***	-0.0452***
ACADMIC	-0.3479E-01	-0.9703E-01	-0.1342
	-0.0278	-0.0508***	-0.0420**
ADJ R-SQ	0.0763	0.1982	0.1964
NO./CASES	5709	5709	5709

Notes: 1. Dependent variables cross columns; independent variables cross rows.
2. First entry in each pair of rows is the unstandardized coefficient; the second entry is the standardized coefficient.

* p < .05 ** p < .01 *** p < .001 **** p < .0001

TABLE 14

EFFECT ESTIMATES OF CURRICULUM AND SELECTED OTHER VARIABLES ON CHILD MEDICAL CARE: NLS YOUTH

	MDPTYC	MSHOTYC	PRENATL	PNMONTH	WELLBC
RURAL14	0.9020E-01	-0.3363E-01	0.4918E-01	0.2686	-0.1344E-02
	0.0271	-0.0365	0.1688	0.0843	-0.0038
URBAN14	0.1048	-0.2147E-01	0.4958E-01	0.2697	0.8152E-02
	0.0434	-0.0236	0.1711	0.0851	0.0231
BLACK	-0.3709E-01	0.2806E-01	-0.1349E-01	0.9932E-01	-0.7958E-02
	-0.0170	0.0340	-0.0517	0.0348	-0.0250
HISPANIC	-0.6130E-01	-0.6864E-01	-0.1305E-01	0.3085	-0.1251E-01
	-0.0217	-0.0642*	-0.0365	0.0833*	-0.0303
AGE	0.5431E-01	0.3636E-01	-0.3893E-02	-0.6442E-01	-0.4295E-02
	0.1100**	0.1943****	-0.0657	-0.0995**	-0.0595
MOINHH14	-0.1460	0.3623E-01	-0.2489E-01	-0.7543E-01	0.3321E-02
	-0.0368	0.0241	-0.0523	-0.0145	0.0057
SMINHH14	-0.5438E-01	-0.4075E-01	0.4969E-01	-0.5439E-01	0.1286E-01
	-0.0062	-0.0122	0.0471	-0.0047	0.0100
FAINHH14	0.2977E-01	-0.1648E-01	0.3677E-02	-0.1986E-01	-0.2007E-01
	0.0139	-0.0204	0.0144	-0.0071	-0.0643
SFINHH14	-0.1652	0.9677E-03	0.3517E-02	-0.7395E-01	-0.2531E-01
	-0.0458	0.0007	0.0081	-0.0156	-0.0481
MTMSEI14	-0.1336E-02	-0.2978E-04	0.7273E-04	-0.1279E-02	-0.1976E-03
	-0.0188	-0.0011	0.0085	-0.0137	-0.0190
MOCHDD14	-0.1260	-0.9941E-02	-0.9639E-02	-0.3340E-01	0.3745E-02
	-0.0617*	-0.0128	-0.0393	-0.0125	0.0125
FTMSEI14	0.2951E-02	0.1338E-03	-0.6831E-03	-0.1836E-02	-0.4154E-03
	0.0445	0.0053	-0.0858*	-0.0211	-0.0428
FOCHDD14	-0.6193E-01	-0.9489E-02	0.6302E-02	-0.5232E-01	-0.1442E-01
	-0.0290	-0.0117	0.0246	-0.0187	-0.0462
MTMEDC1	-0.1816E-01	-0.1485E-01	0.4082E-03	-0.1019E-01	-0.2275E-02
	-0.0461	-0.0994**	0.0086	-0.0197	-0.0395
MEDCHDD1	0.1350	-0.5956E-01	0.2075E-01	-0.7318E-01	0.3789E-02
	0.0304	-0.0354	0.0390	-0.0126	0.0058
FTMEDC1	0.7299E-02	0.2163E-02	0.9769E-03	0.3935E-02	0.1362E-02
	0.0213	0.0166	0.0238	0.0087	0.0272
FEDCHDD1	0.2235E-01	0.3689E-01	-0.9258E-02	-0.3327E-01	-0.2062E-01
	0.0086	0.0374	-0.0296	-0.0097	-0.0542
MSIBS1	0.6018E-02	0.9591E-02	0.3103E-03	0.2780E-01	-0.8681E-03
	0.0159	0.0670*	0.0069	0.0561	-0.0157
INTLANG	0.5195E-01	-0.7692E-02	0.1010E-01	0.1635	-0.1207E-01
	0.0195	-0.0076	0.0316	0.0467	-0.0310
VERBAL3	0.1452E-01	0.1467E-02	0.8983E-03	-0.1545E-01	0.6652E-05
	0.1266*	0.0338	0.0653	-0.1027	0.0004
MATH3	0.4164E-02	-0.2822E-02	0.2568E-03	0.1064E-01	0.1694E-02
	0.0340	-0.0608	0.0175	0.0662	0.0946*
TECHNCL3	-0.1658E-01	0.1708E-02	-0.9113E-03	0.9795E-02	-0.1218E-02
	-0.1097*	0.0298	-0.0503	0.0494	-0.0552
SCITST3	-0.4479E-02	0.2589E-02	-0.1496E-03	0.1756E-02	0.9801E-04
	-0.0362	0.0552	-0.0101	0.0108	0.0054
ASVABMD3	0.2070	0.5046E-01	0.1931E-02	-0.4226	0.2954E-01
	0.0335	0.0215	0.0026	-0.0521	0.0327
HSGRAD3	-0.8594E-02	0.8402E-02	0.1112E-01	-0.1503	0.3686E-01
	-0.0042	0.0107	0.0449	-0.0555	0.1222***
GPA10	0.1444E-01	0.5518E-02	-0.5654E-02	-0.1366E-01	-0.2406E-02
	0.0102	0.0103	-0.0334	-0.0074	-0.0117
CONCNTR	0.3196E-01	-0.2767E-01	-0.3886E-02	0.1771	-0.5386E-02
	0.0091	-0.0207	-0.0092	0.0383	-0.0105
LCONC	0.4476E-01	-0.3653E-01	-0.1585E-01	0.1999	-0.2522E-01
	0.0154	-0.0331	-0.0454	0.0523	-0.0593*
COMEXPL	-0.4323E-01	-0.4543E-01	-0.4558E-02	-0.2661E-01	-0.1229E-01
	-0.0123	-0.0342	-0.0108	-0.0058	-0.0240
ACADTRSC	-0.3579	-0.1862	-0.3721E-01	-0.5468E-01	-0.5652E-01
	-0.0418	-0.0574*	-0.0362	-0.0049	-0.0452
VOCTRK	-0.5279	-0.9310E-01	-0.2573E-02	-0.2022	-0.5928E-02
	-0.0548	-0.0250	-0.0022	-0.0157	-0.0041
ACADMIC	-0.4922	-0.2074	-0.4211E-01	-0.1639	-0.8131E-01
	-0.0627	-0.0686*	-0.0376	-0.0134	-0.0596
ADJ R-SQ	0.0193	0.0586	0.0056	0.0219	0.0066
NO./CASES	1315	1315	1315	1315	1315

Notes: 1. Dependent variables cross columns; independent variables cross rows.
2. First entry in each pair of rows is the unstandardized coefficient; the second entry is the standardized coefficient.

* p < .05 ** p < .01 *** p < .001 **** p < .0001

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Table 14 reveals no strong effects of the curriculum variables on child medical care. Most of the coefficients associated with the curriculum variables are negative, though few are statistically significant. Except where month of first prenatal care (PRENATL) is the dependent variable, the negative signs imply that both vocational and academic curriculum are associated with less child medical care than the general curriculum. This result is not easy to interpret and the finding is not strong. However, one explanation may be that females who follow the academic curriculum in high school tend to delay childbearing. It is possible that those few who do have children early are deviant in other respects as well, including propensity to seek medical care for their children. This interpretation is highly speculative, however, and more analyses would be required before reaching firm conclusions regarding possible effects of high school curriculum on child medical care.

CHAPTER 5

SUMMARY AND CONCLUSIONS

Summary of Findings

This study reports findings from The High School and Beyond Survey (HSB) and The National Longitudinal Survey New Youth Cohort (NLS) of the effects of vocational curriculum on a broad span of noneconomic outcomes and compares those effects to effects of academic curriculum. Some of the outcomes were measured during respondents' senior year in high school, and some of them were measured after high school. The in-school outcomes can conveniently be classified into six categories: (1) test scores (verbal, math, science, and civics); (2) career expectations and related variables (educational expectation, occupational expectation, and perceived college ability); (3) grades and homework time; (4) significant other career expectations or aspirations for the respondent and peer friends, (mother's educational expectation of respondent, mother's college aspiration for respondent, father's college aspiration for respondent, teachers' college aspiration for respondent, counselors' college aspiration for respondent, friends' and relatives' college aspiration for respondent, friends' college plans, amount of time spent with peer friends, and integration of peer friends into high school life); (5) other attitudes (self-esteem, locus of control, altruism, and work values), and deportment ("misbehavior") in school. The post-high school outcomes fit naturally into five categories: (1) four-year college or university education, (2) two-year college or technical training, (3) marriage and family, (4) crime and substance use, and (5) voting behavior (registered, voted).

Three measures of vocational curriculum were used. The vocational profiles created by Paul Campbell and his associates, self-report curriculum track, and a curriculum index based on self-report of courses taken and curriculum track. The difficulty of separating the effects of curriculum from incidental association due to differences among students in different curricula at the beginning of high school is well known. It certainly is not possible to claim an airtight case in any research undertaking, and this generalization applies doubly when one is working with survey data of any type. The present report has attempted to guard against spurious inference by including an extensive array of statistical controls. This strategy was easier to implement with the HSB data than with the NLS because the HSB contain a rich assortment of variables describing youth toward the beginning of their high school careers (sophomore year). In all analyses with the HSB data, controls for sophomore-year test scores, educational expectation, occupational expectation, grades up to the sophomore year in school, average homework time per week, perceived college ability, and several other sophomore year measures were included. Senior year measures of these variables were excluded from controls in the analyses of the post-high school outcomes because the goal was to assess the total effects of vocational curriculum. To control for senior year measures would entail controls for potential outcomes of curriculum. Controls were also implemented for status background, personal characteristics (race, gender, ethnicity), and geographic region.

Since the NLS data do not contain many descriptors of in-school measures, the primary controls were for status background, personal characteristics, and grades. Controls for test scores also were implemented, but the value of these controls is subject to some question as the tests were not taken at the early stages of respondents' high school. Hence, controlling for test scores in the NLS may control for some of the outcomes of curriculum as well as selectivity into curriculum.

Consistent effects of participation in vocational education are observed on a number of key outcomes irrespective of the method of measuring curriculum. The findings indicate not so much that vocational curriculum is detrimental as they do that absence of an academic curriculum is detrimental. The curriculum index is heavily weighted with academic courses, and it is observed to have strong effects on most of the in-school outcomes. It raises test scores, grades and homework, career expectations, and significant others' educational expectations and aspirations for respondents. In contrast, being a vocational concentrator tends to lower these outcomes, but the effects here are not nearly as strong. The evidence is inconsistent regarding the influence of vocational curriculum on postsecondary schooling. In the HSB sample the regression coefficients indicate negative effects of vocational curriculum on four-year college enrollment and near zero effects on other postsecondary schooling. These results are replicated on the total NLS sample, but analyses with the total NLS sample exclude controls for educational and occupational expectation (because most NLS respondents were not asked questions about their educational and occupational expectations until after they had completed most or all of their high school curriculum). Consequently, additional NLS analyses were performed which included controls for educational and occupational expectations/aspirations and limited the sample to the youngest two cohorts. These results showed no negative effects of vocational curriculum on attendance at a four-year college or university and positive effects on attendance at two-year colleges. Reasons for the discrepancies between the HSB and revised NLS results are not clear, though numerous differences in the specification of the statistical models and operational definitions probably account for part of the discrepancies. It will be important to resolve the discrepancies in future research.

The effects of vocational curriculum on the other outcomes are small and inconsistent. There may be a slight tendency for vocational concentrators to use marijuana and other drugs less than general students, but these effects are not large. The HSB results and NLS results regarding marriage and family conflict. In the NLS data, self-report academic curriculum decreases the propensity to marry and decreases fertility. Limited concentrators also are less fertile than general students. None of these effects are observed in the HSB data. No important effects of curriculum are observed on voting behavior. In summary, the effects of curriculum are strong where one would expect--on educational and related outcomes. They are weak elsewhere.

Discussion

It would be easy to misuse the findings reported here. They most emphatically do not imply that vocational education should be phased out in favor of a "tough" academic curriculum. There are several reasons. These are listed below and discussed more fully in the following subsections.

- Most outcomes examined here (e.g., test scores) are tailored to the goals of academic curriculum.
- A hierarchical status system appears to operate in many high schools that probably interferes with achieving the goals of vocational education.
- The evidence regarding curriculum effects remains incomplete.
- The optimum mix of vocational and academic curriculum depends as much on national needs and priorities as it does on the outcomes of vocational education in the education system as it currently operates.

Type of Outcomes

Most of the outcomes measured here are tied specifically to the goals of academic education. None of the tests scores, for example, assess practical knowledge that forms part of the important goals of vocational education. When vocational and academic students are compared on tests that contain specific applied knowledge, vocational students score higher than academic students (Loadman and Rinderer 1986).

Curriculum and Status Hierarchy

Curriculum allocation is highly selective and marked by status distinctions that do not form an intrinsic part of the different curricula. There is no doubt, for example, that vocational education could easily be garnished with the high prestige that currently is reserved for academic studies. One would simply need to make the vocational programs selective enough to assure that not everyone could get in and difficult enough to assure a certain percentage of failures. Combine this strategy with increased financial rewards for vocational education and it appears assured that vocational education would become the high prestige curriculum. Certainly, the content of practical knowledge is complex enough to support such a strategy without imposing artificially strict standards. The barriers would be political and economic. Policy regarding appropriate mix of abstract and practical course work ought to be determined after removing from consideration the status distinctions between curricula that operate in the present system.

The analyses here lend support to "strain" theory. The primary hypothesis in strain theory is that failure to be successful according to contemporary standards generates propensity to various forms of deviance and withdrawal. It appears likely that this phenomenon is operating in some of the findings reported in this study. Those who find themselves outside the preferred academic curriculum and with low to mediocre grades find that there is little reward in expending effort in school and tend to scorn the entire enterprise. This phenomenon is described in persuasive terms by Finley (1984). She characterizes the teacher-student relationships in nonacademic classes as one of negotiation. Students simply refuse to do more than a minimal amount of work, and what they do is negotiated between the students and the teachers. Further, the teaching staff that Finley describes is divided by a status hierarchy in which the high prestige teachers are those who teach academic subjects to the "brightest" students. It is difficult to imagine that such a system could be making optimal use of our nation's human resources or optimally serving the needs of individual youth.

Incomplete Evidence

The present study is based on some of the best available evidence regarding impacts of secondary school curriculum. This evidence nevertheless is incomplete and fragmentary. First, the evidence presented in this report is contradictory. For example, the HSB data indicate that vocational curriculum has a negative effect on four-year college or university attendance and little or no effect on two-year college attendance. In contrast part of the analysis of the NLS data indicate that vocational curriculum in high school does not change the chance of attending a four-year college but does increase the likelihood of attending a two-year college.

Second, it is not clear that all students benefit equally from a given curriculum. The knotty issues implied by the simple idea that the best curriculum for one student may not be the best for another student have not been addressed in this report and, indeed, have not received much research attention anywhere. Yet the issue is a critical one, because there is much informal evidence to suggest that not everyone benefits equally from, say, course work in calculus, or woodshop.[9]

Third, it is well known that measurement error produces bias in coefficients estimated by regression methods. Although the HSB and NLS data were collected with care by a reputable survey firm, measurement error remains an epidemic problem in all social science research. Fourth, all the controls used in the analyses reported here not withstanding, it remains possible, even likely, that the models lack control for some crucial variables.

National Needs and Priorities

A modern industrial society requires a wide variety of skills and knowledge to operate efficiently. Presumably the mix of skills and knowledge in a population has critical bearing on how well the economic and social institutions serve individuals and the general welfare. It seems obvious, for example, that a society in which everyone had expertise in higher mathematics but in which no one had knowledge and skills of plumbing would not function even at a minimum level of satisfaction. Further, it is unlikely that the best way to produce plumbers is to teach everyone mathematics and no one plumbing. Nevertheless, all plumbers do need to know some mathematics (and to be literate). This line of reasoning suggests that an important policy option is to take measures that will help improve the basic skills and career options of vocational students.

Policy Considerations

This study documents strong and pervasive effects of high school curriculum on learning indicators such as test scores and grades, career expectations, and postsecondary schooling. The clearest findings are that those who pursue a strong academic course of study in high school do exhibit stronger growth on test scores, educational and occupational expectation, grades, homework, and perceived ability to complete college. They also are more likely to attend a four-year college or university. Evidence regarding vocational course work is not as strong and consistent as evidence regarding academic curriculum, but the balance of evidence indicates some modest disadvantages to those who take vocational education regarding the outcomes just listed.

Other studies reviewed in this report suggest some important reasons for the findings reported here. First, students who are not pursuing an academic curriculum are not motivated to work hard in school, and little is demanded or expected of them. This conclusion is bolstered in the present study by the finding that academic course work has a strong positive influence on homework. Second, students who do not follow on academic curriculum appear to suffer from a variety of discriminations in school--ranging from teacher and staff prejudice to prejudicial grade-weighting schemes used in calculating grade averages and class rank.

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[9] The National Center for Research in Vocational Education plans to conduct an investigation of the conceptual and methodological issues that appear to pose barriers against successful interaction studies that are needed to resolve the issues raised here.

One of the important policy implications of this report and related work is to improve the incentives for nonacademic students and remove the stigma that often appears to be attached to nonacademic status. Youth need to develop a sense of pride and importance regarding their secondary schooling. They need to realize that their schooling is important and therefore deserves serious effort. In this regard, vocational education potentially has much to offer. To reach this potential, vocational courses must contain important content and require that students learn it. Students of all ability levels should be encouraged to take vocational courses. For vocational concentrators, schooling should be tied to appealing jobs and the chance of obtaining those jobs directly connected to school performance. Vocational students should be required to do well in basic skill development. When they do not, special attention should be devoted to bringing them up to standards. Implementing these conditions, of course, would be difficult, but if they were in place, they would be instrumental in reducing the stigma that currently appears to be associated with nonacademic curricula.

Implementing a demanding vocational curriculum in a high school still leaves unresolved how to handle youth who cannot benefit from demanding course work whether it is vocational or academic. It remains a probing question: What real incentives can be devised for youth who have no realistic prospect of ever obtaining primary labor market employment?

APPENDIX A

VARIABLE NAMES, DEFINITIONS, MEANS, AND STANDARD DEVIATIONS

TABLE A1

VARIABLE NAMES, DEFINITIONS, Ns, MEANS, AND STANDARD DEVIATIONS

Name	Definition	n	mean	std
	HSB Sophomore Cohort			
ACADMIC1	Self report academic or college prep HS program	13943	0.369	0.384
AVGRAD1	Self report grade point ave--4 point scale	14129	2.701	0.801
AVGRAD2	Self report grade point ave--4 point scale	14265	2.854	0.666
CHILDEX1	Does respondent expect do have children? 1=yes, 0=no	12539	0.889	0.314
CHLAGE1	Age at which first child is expected	14265	24.653	2.715
CIVCSD21	Civics test score	14265	50.241	9.467
CIVCSD22	Civics test score	14265	53.808	10.039
CJRCOL3	Currently enrolled in 2 yr college? 1=yes, 0=no	11903	0.120	0.325
COLABL1	Perceived ability to complete college--5 point scale from definitely yes to definitely no	13414	3.993	1.040
COLABL2	Percieved ability to complete college--5 point	14265	4.316	0.815
COLTIM3	Total time in college since 1982	11732	0.706	0.655
CONCPT1	Self-esteem scale--6 Rosenberg items	13703	3.800	0.603
CONCPT2	Self-esteem scale--6 Rosenberg items	14265	3.967	0.567
CUNI4YR3	Currently enrolled in 4 yr college? 1=yes, 0=no	11903	0.275	0.446
CURINDX1	Curriculum index (see text)	14182	0.497	0.249
CVOCSCH3	Currently enrolled in voc school? 1=yes, 0=no	11903	0.036	0.187
DROPOUT2	Dropped out of high school before August 1982. 1=yes, 0=no	14265	0.119	0.324
EDASP1	Level of educational expectation--aprox yrs	13703	14.930	2.650
EDASP2	Level of educational expectation--aprox yrs	14265	14.956	2.427
FAMILY1	Family orientation composite scale	13783	2.428	0.368
FATHER1	Father in household? 1=yes, 0=no	14210	0.746	0.435
HISPNCMP	Hispanic ethnicity? 1=yes, 0=no	14137	0.199	0.399
HOMWRK1	Self report hrs/week spent on homework	14099	4.172	3.389
HOMWRK2	Time spent on homework per week	14265	4.706	4.049
IMSEEQ1	Percieved importance of correcting inequalities	13584	1.806	0.680
IMSEEQ2	Percieved importance in correcting inequalities	13263	1.758	0.666
LFMIMIS1	Missing data dummy for LFMINC1M	14265	0.132	0.339
LFMINC1M	Log of family income--in 1000's	14265	2.871	0.543
LOCUS1	Locus of control--6 Rotter itmes (high=internal)	13677	3.545	0.560
LOCUS2	Locus of control--6 Rotter items (high=internal)	14265	3.690	0.559
MARAHS3	First marriage occured after HS? 1=yes, 0=no	11903	0.119	0.324
MAREX1	Does respondent expect to get married? 1=yes, 0=no	12863	0.915	0.278
MARRIED1	Married at time of interview? 1=yes, 0=no	12863	0.003	0.053
MATHSD21	Math test score	14265	50.136	8.962
MATHSD22	Math test score	14265	51.618	9.857
MDRURAL2	Missing data dummy for RURALDM2	11903	0.120	0.325
MOTHER1	Mother in household? 1=yes, 0=no	14209	0.914	0.281

NCHAHS3	Number of children after HS	11903	0.102	0.359
OCCASP1	Level of occupational expectation--Duncan SEI	14265	51.797	20.299
OCCASP2	Level of occupational expectation--Duncan SEI	14265	51.036	21.449
OTFGRD1	Other female guardian in household? 1=yes, 0=no	14207	0.040	0.197
OTMGRD1	Other male guardian in household? 1=yes, 0=no	14206	0.093	0.291
PARAHS3	Parent after HS? 1=yes, 0=no	11903	0.086	0.280
PARENT1	Parent at time of interview? 1=yes, 0=no	12539	0.007	0.086
PRACADD	Academic curriculum as defined from transcripts, (see text)	13312	0.022	0.251
PRCONCD	Profile concentrator (see text)	13312	0.108	0.311
PRCONEXD	Profile concentrator explorer (see text)	13312	0.115	0.319
PRLCONCD	Profile limited concentrator (see text)	13312	0.178	0.383
REGVOTE3	Registered to vote since age 18? 1=yes, 0=no	11625	0.552	0.497
RURALDM2	Lived in rural area? 1=yes, 0=no	11903	0.171	0.353
SCINDS22	Science test score	14265	51.606	9.780
SCINSD21	Science test score	14265	49.869	9.551
SESNINC1	SES index--average of 8 parental status variables: Father's occupation, father's education, mother's occupation, mother's education, number of family possessions from a list, home ownership, number of rooms in the home, and number of siblings (reflected)	14265	-0.014	0.606
SEPAHS3	Separated from a marriage since HS? 1=yes, 0=no	11903	0.009	0.095
SMDEPRT1	Summary deportment index (see text)	14249	-0.126	3.649
SMDEPRT2	Summary deportment index (see text)	14122	0.345	4.523
TIMWFRN1	Index of time spent with friends	14003	1.567	1.410
TIMWFRN2	Index of time spent with friends	12199	2.815	1.432
TYPFRN1	Index describes type of friends, high values indicate nondeviant	13894	0.807	0.283
TYPFRN2	Index describes type of friends, high values indicate nondeviant	12037	0.841	0.264
URBANDM2	Lived in urban area? 1=yes, 0=no	11903	0.621	0.455
VERBAL1	Verbal test score	14265	50.148	8.697
VERBAL2	Verbal test score	14265	53.180	9.312
VOC1	Self report vocational HS program	13943	0.180	0.384
VOTED3	Voted in any election since age 18? 1=yes, 0=no	11566	0.354	0.478
WORKVAL1	Work orientation composite scale	13798	2.642	0.314
WORKVAL2	Work orientation composite scale	13429	2.645	0.308

NLS YOUTH -- 1979 to 1984 INTERVIEWS

Name	Definition	N	Mean	Std
ACADMIC	Self report high school academic track	8265	0.115	0.141
ACADTRSC	Academic student from transcript data	8265	0.048	0.225
AGE	Age of respondent as of September 1983	8265	23.241	2.103
ALCOHLU4	Composite of alcohol use in 1981	5314	0.050	0.624
ALCOHLU5	Composite of alcohol use in 1982	5421	0.048	0.645
ASVABMD3	Missing dummy for Asvab test battery	8265	0.043	0.206
ATN2YCOL	Ever attended a 2 year college? 1=yes, 0=no	8265	0.213	0.430
ATN4YCOL	Ever attended a 4 year college? 1=yes, 0=no	8265	0.324	0.452
BLACK	Member of black race? 1=yes, 0=no	8265	0.230	0.472
CGTRNAHS	completed government training after leaving high school	8265	0.016	0.164
COM2YCOL	Completed a 2 yr associate degree? 1=yes, 0=no	8265	0.040	0.151
COM4YCOL	Completed a 4 yr bachelor degree? 1=yes, 0=no	8265	0.067	0.269
CONCNTR	Concentrator from transcript data	8265	0.091	0.217
CONEXPL	Concentrator explorer from transcript data	8265	0.084	0.201
COTRNAHS	Completed other training after leaving high school	8265	0.083	0.200
EDASP1	Highest grade desired, base yr.	2157	14.358	2.132
EDATTN6	Highest grade completed as of 1983	8235	12.629	1.871
EDEXP1	Highest grade expected, base yr.	2157	13.800	2.138
EVRMAR	has respondent ever been married? 1=yes, 0=no	8265	0.361	0.436
FAINHH14	Father in household at age 14? 1=yes, 0=no	8265	0.739	0.493
FEDCMDD1	Missing dummy for father's education	8265	0.136	0.304
FOCMDD14	Missing dummy for father's occupation at age 14	8265	0.283	0.417
FTHEDC1	Father's education as of 1978	7141	11.408	3.677
FTHSEI14	Duncan SEI of father's occupation at age 14	4836	35.013	22.029
GPA10	Sophomore grade point average from transcript data -- 4 point scale	7749	2.435	0.764
HISPANIC	Hispanic ethnicity? 1=yes, 0=no	8265	0.149	0.394
HSGRAD3	High school graduate as of 1980? 1=yes, 0=no	8265	0.544	0.424
ILLINC2	Percentage of income earned from illegal acts in 1979	8265	0.027	0.048
INTLANG	82, 83, or 84 interview conducted in langauge other than English	8265	0.186	0.304
LCONC	Limited concentrator from transcript data	8265	0.144	0.337
LTDRGU6	Lifetime drug use (other than pot)	8265	61.331	338.226
LTPOTU6	Lifetime pot/hash use	7866	142.048	324.630
MARAHS	Married after leaving high school? 1=yes, 0=no	8265	0.971	0.160
MATH3	Asvab math test score	8265	41.488	13.968
MEDCMDD1	Missing dummy for mother's education	8265	0.058	0.286
MOCMDD14	Missing dummy for mother's occupation at age 14	8265	0.495	0.503
MOINHH14	Mother in household at age 14? 1=yes, 0=no	8265	0.941	0.299
MSHOTYC	Index of measles shots given to youngest child in 1982 and 1983	1360	0.612	0.377

MTHEDC1	Mother's education as of 1978	7782	11.218	2.833
MTHSEI14	Duncan SEI of mother's occupation at age 14	4174	34.234	22.040
NCIGSLM6	Number of cigarettes smoked per day last month -- 1983	4601	9.458	11.040
NCHILD6	Number of children as of 1983	8265	0.443	0.766
NDPTYC	Index of DPT shots given to youngest child in 1982 and 1983	1356	2.510	0.725
NSIBS1	Number of siblings as of 1978	8265	3.670	2.537
NSPOTLM6	Number of times smoked pot/hash last month -- 1983	8265	2.124	7.147
NSPOTMS6	Number of months since 1979 used pot	8265	11.339	20.328
NSRCRIME	Non-serious crimes committed as of 1979	7884	0.881	3.075
OCCHANC1	Expectation of achieving occ asp, base yr.	2157	2.862	0.699
PARENT6	Was respondent a parent in 1983? 1=yes, 0=no	8265	0.298	0.409
PNMONTH	Month first received prenatal care in 1982 and 1983	1516	2.783	1.310
PRENATL	Index of prenatal care in 1982 and 1983	1583	0.388	0.105
PSTOPLY2	Number of times stopped by police in 1979	7563	0.311	1.764
RGTRNAHS	Received government training after leaving high school	8265	0.028	0.190
ROTRNAHS	Received other training after leaving high school	8265	0.215	0.433
RURAL14	Lived in rural area at age 14? 1=yes, 0=no	8265	0.219	0.409
SCITST3	Asvab general science test score	8265	14.839	4.930
SEIASP1	Duncan SEI index of aspired occ, base yr.	2157	52.900	23.311
SERCRIME	Serious crimes committed as of 1979	7886	0.592	2.289
SEX	Sex of respondent 1=female, 0=male	8265	0.512	0.482
SFINHH14	Stepfather in household at age 14? 1=yes, 0=no	8265	0.059	0.274
SLDPOT2	Number of times sold pot in 1979	7806	0.308	1.090
SMINHH14	Stepmother in household at age 14? 1=yes, 0=no	8265	0.015	0.124
SMKPOT2	Number of times smoked pot in 1979	7821	1.797	2.353
SOTHDRG2	Number of times sold hard drugs in 1979	7825	0.054	0.448
TECHNCL3	Asvab technical test score	8265	24.209	8.782
UOTHDRG2	Number of times used other drugs in 1979	7805	0.568	1.326
UOTHDRG6	drug use other than pot last month -- 1983	8265	0.620	5.473
URBAN14	Lived in urban area at age 14? 1=yes, 0=no	8265	0.778	0.411
VERBAL3	Asvab verbal test score	8265	34.791	10.679
VOCTRK	Self report high school vocational track	8265	0.057	0.185
WELLBC	Number of months received well baby care in 1982 and 1983	1583	0.345	0.159

NOTE: The last character of most variables is a number indicating the time measurement, 1=base year, 2=1st follow-up, etc. Variables not ending with numbers are a composite or were only measured once. A few exceptions to this convention occur, as identified in the variable definitions.

APPENDIX B

PROBIT TABLES

TECHNICAL NOTES

Table B1 displays comparisons between OLS and probit estimates for postsecondary schooling using the HSB data. Table B2 shows the same comparisons for marriage after high school.

Three technical notes on these tables are needed. First, the reported sample sizes differ from those in the text because means were substituted for missing values of independent variables here, and linewise deletion was used in the text. Second, the line labled "Adj. R-sq" contains adjusted R-squares for OLS estimates. The entries on this line for probit results are phi-squares ($\emptyset^2$) calculated on the crosstabulation of predicted and observed responses on the dependent variable. Omitted phi-squares are due to too few predicted 1's (0 or 1 case predicted to = 1). Third, the effect estimates for probit were calculated at the maximum on the normal curve ($Z = 0$). They are differences between the integral index the normal curve for each independent variable set to 0 and then to 1. This procedure also was applied to the curriculum index (CURINDX1) even though it is not dichotomous. (The calculation has an obvious interpretation).

TABLE B1

EFFECT ESTIMATES OF CURRICULUM ON CURRENT ENROLLMENT IN POSTSECONDARY SCHOOL: OLS-PROBIT COMPARISONS

	University or 4. Yr. College (UNI4YR3)			Community or Junior College (CJRCOL3)			Vocational/Technical School (VOCSCH3)		
		Probit			Probit			Probit	
	OLS	Coeff.	Effect	OLS	Coeff.	Effect	OLS	Coeff.	Effect
PRCONCD	-.0809****	-.2245***	-.0890	.0193	.1067	.0425	.0133*	.1412	.0562
PRLCONCD	-.0458****	-.0904*	-.0362	.0220**	.1106**	.0441	.0061	.0754	.0301
PRCONEXD	-.0366**	-.0864	-.0344	.0080	.0397	.0158	.0060	.0655	.0261
PRACADD	.0996****	.1396	.0555	-.0622**	-.3712**	-.1450	-.0090	-.2207	-.0874
CURINDXI	.3887****	1.9797****	.6777	.0083	.0685	.0273	-.0054	-.7745	-.0309
NO./CASES		11903			11903			11903	
Adj R-sq	.3491	.2949	--	.0395	--	--	.0084	--	--

TABLE B2

EFFECT ESTIMATES OF CURRICULUM ON MARRIAGE AFTER HIGH SCHOOL: OLS-PROBIT COMPARISONS

	Females			Males		
		Probit			Probit	
	OLS	Coeff.	Effect	OLS	Coeff.	Effect
PRCONCD	.0102	.0896	.0357	.0032	.0425	.0169
PRLCONCD	-.0035	.0082	.0033**	-.0114	-.0785	-.0313
PRCONEXD	.0346*	.1551*	.0617	-.0077	-.0489	-.0195
PRACADD	-.0037	-.1838	-.0732**	-.0209	-5.2012	-.5492
CURINDXI	-.0648**	-.3473**	-.1379	-.0149	-.1347	-.0537
NO./CASES		6105			5798	
Adj R-sq	.1503	.0698	--	.0654	--	--

REFERENCES

Alexander, Karl L.; Cook, Martha A.; and McDill, Edward L. "Curriculum Tracking and Educational Stratification: Some Further Evidence." American Sociological Review 41 (1973): 144-152.

Alexander, Karl L., and Cook, Martha A. "Curricula and Coursework: A Surprise Ending to a Familiar Story." American Sociological Review 47 (1982):626-640.

Alexander, Karl L., and McDill, Edward L. "Selection and Allocation within Schools: Some Causes and Consequences of Curriculum Placement." American Sociological Review 41 (1976): 963-980.

Arminger, Gerhard. "Estimation of Parameters of Linear Stochastic Differential Equations and their Covariances from Panel Data." Paper presented at the Annual Meetings of the American Sociological Association, 1983.

Borus, Michael, E.; Crowley, Joan E.; Rumberger, Russell W.; Santos, Richard; and Shapiro, David. Youth Knowledge Development Report 2.7. Findings of the National Longitudinal Survey of Young Americans, 1979. Washington, DC: U.S. Government Printing Office, 1980.

Bowles, S., and Gintes, H. Schooling in Capitalist America: Educational Reform and the Contradictions of Economic Life. New York: Basic Books, 1976.

Boyer, Ernest L. High School: A Report on Secondary Education in America. New York: Harper & Row Publishers, 1982.

Campbell, Paul B.; Gardner, John A.; and Seitz, Patricia. High School Vocational Graduates: Which Doors Are Open? Columbus: The National Center for Research in Vocational Education, The Ohio State University, 1982.

Campbell, Paul B. "Vocational Education: Access, Equity, and Consequence." Educational Horizons 65, No. 1 (1986): 10-15.

Campbell, Paul B., and Basinger, Karen S. Economic and Noneconomic Effects of Alternative Transitions through School to Work. Columbus: The National Center for Research in Vocational Education, The Ohio State University, 1985.

Campbell, Paul B.; Basinger, Karen S.; Dauner, Mary Beth.; and Parks, Marie A. Outcomes of Vocational Education For Women, Minorities, The Handicapped, and the Poor. Columbus: The National Center for Research in Vocational Education, The Ohio State University., 1986.

Campbell, Richard T. "Status Attainment Research: End of the Beginning or Beginning of the End?" Sociology of Education 56 (January 1983): 47-62.

Campbell, Paul B.; Orth, Mollie N.; Seitz, Patricia. Patterns of Participation in Secondary Vocational Education. Columbus: The National Center for Research in Vocational Education, The Ohio State University, 1981.

Campbell and Panzano, Phyllis. Elements of Vocational Program Quality. Columbus: The National Center for Research in Vocational Education, The Ohio State University, 1985.

Cicourel, Aaron and John and Kitsuse. The Educational Decision-Makers, Indianapolis: Bobbs-Merrill Company, Inc., 1963.

Coleman, James S. "The Mathematical Study of Change." In Methodology in Social Research, edited by Herbert M. Blalock and Ann B. Blalock, pp. 428-478. New York: McGraw-Hill, 1968.

Darcy, Robert L. Some Key Outcomes of Vocational Education: A Report On Evaluation Criteria, Standards, and Procedures. Columbus: The National Center for Research in Vocational Education, The Ohio State University, 1980.

Daymont, Thomas N., and Rumberger, Russell. "The Impact of High School Curriculum on the Earnings and Employability of Youth." In Job Training For Youth 1982, edited by Robert E. Taylor, Howard Rosen, and Frank C. Pratzner, pp. 279-306. Columbus, Ohio: The National Center for Research in Vocational Education, The Ohio State University, 1982.

Doreian, Patrick, and Norman P. Hummon. Modeling Social Process. New York: Elsevier, 1976.

Elliot, Delbert S., David Huizinga, and Suzanne A. Ageton. Explaining Delinquency and Drug Use. Beverly Hills, CA: Sage Publications, 1985.

Farley, Joanne. Vocational Education Outcomes: A Thesaurus Of Outcome Questions. Columbus: The National Center for Research in Vocational Education, The Ohio State University, 1979.

Finley, Merrillee K. "Teachers and Tracking in a Comprehensive High School." Sociology of Education 57 (1984): 233-243.

Gamoran, Adam. "The Stratification of High School Learning Opportunities." Paper presented at the Annual Meeting of the American Education Research Association, San Francisco, 1986.

Gardner, John A. "Influences of High School Curriculum on Determinants of Labor Market Experiences." Paper presented at the annual meeting of the American Educational Research Association, New Orleans, Louisiana. April 1984 (revised July 1984).

Goodlad, John I. A Place Called School: Prospects for the Future. New York, NY: McGraw-Hill Book Company, 1984.

Grasso, John J. T., and Shea, John J. R. "Effects of Vocational Education Programs: Research Findings and Issues. In The Planning Papers for Vocational Education Study. Washington, DC: National Institute of Education, 1979.

Gustman, A. L., and Steinmeier, T. L. The Relation between Vocational Training in High School and Economic Outcomes. (Revised February 1981). Technical Analysis Report Series. Washington, D.C: Office of Technical and Analytic Systems, Office of Planning and Budget, U.S. Department of Education, 1981.

Gustman, Alan L., and Steinmeier, Thomas. The Relationship Between Vocational Training in High School and Economic Outcomes. Cambridge, MA: National Bureau of Economic Research, 1981.

Hamilton, Stephen F. 1976. "Raising Standards and Reducing Dropout Rates." Teachers College Record 87, No. 3 (1986).

Hannan, Michael T., and Alice A. Young. "Estimation in Panel Models: Results on Pooling Cross-Sections and Time Series." In Sociological Methodology 1977, edited by David R. Heise, pp. 52-83. San Francisco, CA: Jossey-Bass, 1977.

Hauser, Robert M.; William H. Sewell; and Duane F. Alwin. "High School Effects on Achievement." In Schooling and Achievement in American Society, edited by William H. Sewell, Robert M. Hauser, and David L. Featherman, pp.309-342. New York: Academic Press, 1976.

Hauser, Robert M.; Shu-Ling Tsai; and William Sewell. "A Model of Stratification with Response Error in Social and Psychological Varibles." Sociology of Education 56 (1983): 20-46.

Haveman, Robert H.; and Wolfe Barbara L. "Schooling and Economic Well-Being: The Role of Nonmarket Effects." The Journal of Human Resources 14, No. 3, (Summer 1984), pp. 377-407.

Heyns, Barbara. "Social Selection and Stratification within Schools." American Journal of Sociology 79 (1974): 1424-1451.

Jencks, Christopher; Crouse, James; and Mueser, Peter. "The Wisconsin Model of Status Attainment: A National Replication with Improved Measures of Ability and Aspiration." Sociology of Education 56 (January 1983): 3-19.

Jencks, Christopher; Smith, Marshall; Acland, Henry; Bane, Mary Jo; Cohen, David; Gintis, Herbert; Heyns, Barbara; and Michelson, Stephan. Inequality. New York: Basic Books, Inc., 1972.

Judge, George G.; Griffiths, William E.; Hill, R. Carter; and Lee, Tsoung-Chao. The Theory and Practice of Econometrics. New York: John Wiley and Sons, 1980.

Loadman, William E., and Rinderer, Ray E. Comparison Study of Vocational and Traditional Students on Mathematics and Science Achievement. Columbus: The Ohio State University, 1986.

Lotto, Linda S. Building Basic Skills: Results From Vocational Education. Columbus: The National Center For Research In Vocational Education, The Ohio State University, 1983.

Mann, Dale. "Can We Help Dropouts: Thinking about the Undoable." Teachers College Record. Teachers College, Columbia University, 87, No. 3 (1986).

McKinney, Floyd L.; and Fornash, Patricia. Selected Evidence Supporting Or Rejecting Eighteen Outcomes for Vocational Education. Columbus: The National Center For Research in Vocational Education, The Ohio State University, 1983.

Mertens, Donna M. "Social Theory and Social Structure," American Sociological Review 47, (1957):43-44.

Mertens, Donna M.; McElwain, Douglas; Garcia, Gonzalo; and Whitmore, Mark. The Effects of Participating in Vocational Education: Summary of Studies Reported Since 1968. Columbus: The National Center for Research in Vocational Education, The Ohio State University, 1980.

Mertens, Donna M.; Seitz, Patricia; and Cox, Sterling. Vocational Education and the High School Dropout. Columbus: The National Center for Research in Vocational Education, The Ohio State University, 1982.

Mertens, Donna M., and Gardner, John A. Vocational Education and The Younger Adult Worker. Columbus: The National Center For Research in Vocational Education, The Ohio State University, 1981.

~~101~~ 99

Meyer, Robert H. *An Economic Analysis of High School Vocational Education: IV. The Labor Market Effects of Vocational Education*. Washington, DC: The Urban Institute, August 1981.

Meyer, Robert H., and Wise, David A. "High School Preparation and Early Labor Force Experience." In *The Youth Labor Market Problem: Its Nature, Causes, and Consequences*, edited by R. B. Freeman and D. A. Wise, pp. 277-339. Chicago: University of Chicago Press, 1982.

National Commission on Secondary Vocational Education. *The Unfinished Agenda The Role of Vocational Education in the High School*. Columbus: The National Center for Research in Vocational Education, The Ohio State University, 1984.

Oakes, Jeannie. "The Reproduction of Inequality: The Content of Secondary School Tracking." *The Urban Review* 14 (1982): 107-120.

Oakes, Jeannie. "*Keeping Track: How Schools Structure Inequality*. New Haven: Yale University Press, 1985.

Rehberg, Richard A., and Evelyn R. Rosenthal. *Class and Merit in the American High School: An Assessment of the Revisionist and Meritocratic Arguments*. New York: Longman, 1978.

Rosenbaum, James E. *Making Inequality: The Hidden Curriculum of High School Tracking*. New York: John Wiley and Sons, 1976.

Rosenbaum, James E. 1980a. "Social Implications of Educational Grouping." *In Review of Research in Education*, edited by David C. Berliner, pp. 361-401. American Educational Research Association, 1980a.

Rosenbaum, James E. "Track Misperceptions and Frustrated College Plans: An Analysis of the Effects of Tracks and Track Perceptions in the National Longitudinal Survey." *Sociology of Education* 53, No. 2 (1980b): 74-88.

Rumberger, Russell W., and Daymont, Thomas N. "The Economic Value of Academic and Vocational Training Acquired in High School." In Youth and the Labor Market, edited by Michael E. Borus, pp. 157-192. Kalamazoo, MI: W. E. Upjohn Institute for Employment Research, 1984.

Schafer, Walter E.; and Olexa, Carol. *Tracking and Opportunity: The Locking-Out Precess and Beyond*. Scranton: Chandler Publishing Company, 1971.

Silberman Harry F. "Vocational Education under the Microscope." *Journal of the American Vocational Association* 21, No. 1, Fall 1979.

Silberman Harry F. "Improving the Status of High School Vocational Education" Educational Horizons 65, No. 1 (1986): 5-9.

Spring, Joel. The Sorting Machine: National Educational Policy Since 1945. New York: David McKay, 1976.

Stinchcombe, Arthur L. Rebellion in a High School. Chicago: Quandrangle Books, 1964.

Sutherland, Edwin H., and Cressey, Donald R. Principles of Criminology. Philadelphia: J. B. Lippincott Company, 1966.

Thurow Lester C. Generating Inequality: Mechanisms of Distribution in the U.S. Economy. New York: Basic Books, 1975.

Tuma, Nancy Brandon, and Michael T. Hannan. Social Dynamics: Models and Methods. Orlando: Academic Press, Inc., 1984.

Weber, James M. The Role of Vocational Education in Decreasing the Dropout Rate. Columbus: The National Center for Research in Vocational Education, The Ohio State University, 1986.

Weber, James M.; Silvani-Lacey, Cindy.; Williams, E. Jane.; Winkfield, Patricia Worthy.; Manning, Kevin J.; Okeafor, Karen.; and Denniston, Denie. Interium Report: Comparative Study of Basic Skills in Vocational Education. Columbus: The National Center for Research in Vocational Education, The Ohio State University, 1982.

Wiatrosky, Michael D. 1982. "Curriculum Tracking and Delinquency." American Sociological Review 47 (1982): 151-160.

Wiley, David E., and Harnischfeger, Annegret. High School Learning, Vocational Tracking, and What Then? Illinois: Cemrel, Inc., 1980.

Woods, Elinor M., and Haney, Walt. Does Vocational Education Make A Difference? A Review of Previous Research and Reanalyses of National Longitudinal Data Sets. Cambridge, MA: The Huron Institute, 1980.